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FROM

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WASHINGTON, D. C.

MEXICO.

GEOGRAPHICAL SKETCH, NATURAL RESOURCES, LAWS, ECONOMIC CONDITIONS, ACTUAL DEVELOPMENT, PROSPECTS OF FUTURE GROWTH.

PUBLISHED BY THE INTERNATIONAL BUREAU OF THE AMERICAN REPUBLICS.

1904.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
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NOTE.

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MÉXICO

CHAPTER I.

GEOGRAPHICAL SKETCH—AREA AND POPULATION—TOPOGRAPHY—CLIMATOLOGY—OROGRAPHY—HYDROGRAPHY.

GEOGRAPHICAL POSITION.

The country called México, or New Spain, by the historians of the last century was situated between 9° and 40° north latitude, and 80° and 50° west longitude. Its length was 2,100 miles, and its breadth 1,600. The United Mexican States of to-day, according to the latest official data, lie between 14° 30′ 42″ and 32° 42′ latitude north, and 86° 46′ 8″ and 117° 7′ 31″ longitude west from Greenwich, having a superficial area of about 1,987,201 square kilometers. The northern and eastern boundary of the Republic is the United States of America; the eastern, British Honduras, the Caribbean Sea, and the Gulf of México; its southern, the Pacific Ocean, Guatemala, and British Honduras; and the western, the Pacific Ocean. Its greatest length is about 3,126 and its greatest width 1,226 kilometers. The widest part is along its boundary with the United States, and the narrowest the Isthmus of Tehuantepec, where the distance from ocean to ocean is only about 216 kilometers. The coast line measures 8,830 kilometers, as follows: Gulf of México and Caribbean Sea coast, 2,580; Pacific Ocean and Lower California, 6,250, the latter having 3,000 kilometers coast line.

AREA AND POPULATION.

The area and population of the Republic, according to the latest revised figures of the census, October 28, 1900, also the census figures

of 1895 and the percentage of population per square kilometer in 1900, is shown in the following table prepared from Mexican official data:

States and territories.	Area in square kilometers.	Population.		
		Census, 1895.	Census, 1900.	Per square kilometer.
CENTRAL STATES.				
Federal District	1,498.75	468,705	541,516	361.2
Aguascalientes	7,692.00	102,378	102,416	13.3
Durango	109,495.00	292,549	370,304	3.3
Guanajuato	28,363.00	1,047,817	1,061,724	37.
Hidalgo	22,215.00	551,817	605,051	27.1
México	23,185.00	837,981	934,463	40.1
Morelos	7,082.25	156,786	160,115	2.21
Puebla	31,616.00	973,876	1,021,133	32.30
Querétaro	11,638.00	224,648	232,389	19.93
San Luis Potosí	62,177.00	562,195	575,432	9.25
Tlaxcala	4,132.00	163,244	172,315	41.68
Zacatecas	63,386.00	447,265	462,190	7.29
NORTHERN STATES.				
Chihuahua	223,094.00	260,008	327,784	1.40
Coahuila	165,099.00	237,815	296,938	1.79
Nuevo Leon	61,343.00	307,856	327,937	5.34
Sonora	198,496.00	189,158	221,462	1.11
GULF STATES.				
Campeche	46,855.00	87,264	86,542	1.84
Tabasco	26,094.00	133,926	159,834	6.12
Tamaulipas	83,597.00	203,342	218,948	2.61
Veracruz	75,863.00	853,842	981,030	12.86
Yucatán and Territory of Quintana Roo[a]	91,201.00	277,088	314,087	3.44
PACIFIC STATES.				
Lower California (territory)	151,109.00	41,838	47,624	.31
Colima	5,887.00	55,264	65,115	11.06
Chiapas	70,524.00	318,730	360,799	5.11
Guerrero	64,756.00	417,886	479,205	7.40
Jalisco	86,752.00	1,094,569	1,153,891	13.30
Michoacán	58,594.00	887,008	930,083	15.87
Oaxaca	91,664.00	872,902	948,633	10.34
Sinaloa	71,380.00	256,858	296,701	4.15
Tepic (territory)	28,371.00	146,805	150,098	5.29
Islands	4,042.00			
Total	1,987,201.00	12,491,573	13,605,819	6.85

[a] The Territory of Quintana Roo was created by act of December 14, 1900, and by act of February 25, 1904, its political and municipal organization was established.

Race and nationality.—Of the total population 19 per cent are of pure or nearly pure white race, 43 per cent of mixed race, and 38 per cent of Indian race. Natives descended from ancient Indian tribes, and speaking little or no Spanish, numbered in 1895, 1,908,707. Of the mixed and Indian race only a very small proportion can be regarded as civilized. The foreign population in 1900 numbered 57,511. The nationalities most numerously represented were the United States, 15,265; Guatemalan, 5,804; other Americans, 3,379; Spanish, 16,258; French, 3,976; British, 2,845; German, 2,565; Italian, 2,564; other European, 1,592; Chinese, 2,834.

Baron von Humboldt, who at the beginning of the nineteenth century visited Mexico, in his work "Political Essay on New Spain," quotes at length a census made in 1810 by Dr. Fernando Navarro y Noriega, according to which the total population of México amounted then to

6,122,354 inhabitants, divided as follows: Europeans, including ecclesiastics and nuns, 18 per cent; Indians, 60 per cent, and mixed races 22 per cent. In 1875, according to the census, the total population had increased to 9,495,157 inhabitants, divided as follows: Europeans and descendants of the Spaniards, 20 per cent; mixed races, 43 per cent, and native Indian race, 37 per cent.

During the sixty-five years elapsed between the two above-mentioned censuses, deducting from the census of 1810 the inhabitants of Texas, New Mexico, and Upper California (estimated at 58,338 individuals), the increase of the population was 3,431,141, showing an increase in the European element of 1.1 per cent per annum and in the mixed race 3.25, while the native Indian decreased at the rate of 0.58 per cent per annum.

VITAL STATISTICS. (a)

Births.—According to the "Anuario Estadístico" for 1902, the number of births for the Republic during 1901 was 470,060, of which 224,259 were males and 225,801 females. The total population, as given by the census of 1900, being 13,605,919 inhabitants, the birth rate is 34.50 per 1,000 inhabitants.

Deaths.—The total number of deaths during the same year was 444,900, of which 231,061 were males and 213,839 females, the death rate being 32.19 per 1,000 inhabitants. Further classification of the deaths shows that there died 393,348 natives and 1,128 foreigners.

BOUNDARIES.

With the United States.—The boundary with the United States, as fixed by the treaties of February 2, 1848, and December 30, 1853, begins at the mouth of the Rio Grande on the Gulf of México and follows the river for 1,136 miles beyond El Paso, Tex., to the point where it meets parallel 31° 47′ latitude north, thence along said parallel for a distance of 100 miles; thence south to parallel 31° 20′ north latitude, following this parallel in a westerly direction as far as the one hundred and eleventh meridian of longitude west from Greenwich. Thence it runs in a straight line to a point on the Colorado River 20 miles below the junction of the Gila, thence up the middle of said Colorado River to the intersection with the old line between Upper and Lower California, and thence to a point on the Pacific Ocean distant 1 marine league due south of the southernmost point of the Bay of San Diego, the total distance from El Paso, Tex., to the Pacific being 674 miles. The whole extent of the boundary between the two countries is 1,833 miles. As this boundary line runs from the southeast to the northwest, México has on the Pacific side 6° 34′ 20″ of latitude more than on the Gulf side.

Owing to the discovery of mines in the immediate vicinity of the

(a) See tables on pages 410–411, Chapter XIX.

boundary line some years later, difficulties arose regarding the exact location of the line and the destruction of some of the original marks. A convention was then concluded between the two Governments at the city of Washington on the 29th of July, 1882, providing for the appointment of an international boundary commission to ascertain the condition of the monuments marking the boundary line, a preliminary reconnoissance of the same line to be made by both Governments in accordance with the stipulations of the convention. The reconnoissance was made in 1883 by officers of both Governments, independently, and their respective reports were submitted showing the necessity of a more definite demarcation of the boundary line. The other stipulations of this convention were not carried into effect in due time, and another convention to revive and continue the same was concluded at Washington between the two Governments on the 18th of February, 1889. In compliance with this new convention the officers appointed by the two Governments began the work assigned to them, and presented their joint report dated Washington, August 14, 1896.[a]

With Guatemala.—The boundary with Guatamala is fixed by the treaties of September 27, 1882, and April 1, 1895. It runs from a point on the Pacific coast, 3 leagues distant from the upper mouth of the river Zuchiate, to the Caribbean Sea, following the course indicated by the treaties. The boundary with Belize is defined by a treaty signed at the City of México on July 8, 1893, and ratified by the Mexican Senate on April 19, 1897. This line runs from the mouth of Boca Bacalar Chica—a strait separating Yucatán from Ambergris Key—to the boundary between México and Guatemala, following the demarcation set forth in the treaty.

Cessions of territory.—By the treaties known as the Guadalupe-Hidalgo treaty, February 2, 1848, and the Gadsden treaty, December 30, 1853, México ceded to the United States 930,590 square miles, or over one-half of her former territory. The area of each of the Mexican cessions to the United States is estimated as follows:

	Square miles.
Annexation of Texas	362,487
By Guadalupe-Hidalgo treaty	522,568
By Gadsden treaty	45,535
Total	930,590

TOPOGRAPHY.

The country possesses a curious physical formation. Rising rapidly by a succession of terraces from the low sandy coasts on the east and west, it culminates in a central plateau running in a northwesterly and southeasterly direction, and having an elevation varying from

[a] Report of the International Boundary Commission, United States and Mexico, 1891–1896.

4,000 to 8,000 feet above the sea. High above this plateau tower the snow-capped crests of several volcanoes, most of which are extinct. The highest peaks are the volcanoes of Popocatepetl, 17,540 feet; the Orizaba or Citlaltepetl, 17,362 feet; the Ixtacihuatl, 16,076; Toluca, 15,019; Colima, 14,363, and Ajusco, 13,628 feet, besides several others varying from 4,000 to 13,000 feet in height.[a]

OROGRAPHY.

Two cordilleras, or high mountain ranges, traverse México, running almost parallel to the coast, one along the Gulf of México and the other along the Pacific coast. The former runs from 10 to 100 miles from the coast, leaving an imperceptibly inclined plane between the sea and the foot of the mountains, while the cordillera on the Pacific side runs very near the coast, leaving a very narrow strip of land between the mountains and the sea. This range has several branches running in different directions, the most continuous being the Sierra Madre of the Pacific. Parallel to this last-named range is the Sierra de la Giganta in Lower California, which slopes abruptly toward the east like the Atlantic escarpments. Corresponding with the Sierra Madre on the west are the broken eastern scarps of the central plateau.

The cordillera of Anahuac, which surrounds the valleys of Tenochtitlan and Puebla, is the most important orographically and historically of the central cross ridges and is supposed to culminate in Popocatepetl and Ixtacihuatl. It seems, however, that these volcanoes belong to a more recent upheaval, as they are nearly at right angles to the main axis of the central plateau, south of the line formed by the Orizaba or Citlaltepetl, on the coast south of Veracruz, to which correspond, on the west, the Jorullo, in Michoacán, Colima, near the coast in Jalisco and the Revillagigedo group on the Pacific. Nearly parallel to these are the sierras of Guerrero and southeast of the Isthmus of Tehuantepec those of Oaxaca and Chiapas toward the frontier of Guatemala. In the course of time these mountains have become disintegrated by rain and other natural causes, and the filling up of the spaces between them has formed a series of valleys rich in agricultural resources. These valleys, known as the central plateau, run for about 150 miles east of the City of México, in a northwesterly direction. The plateau is so level that when there were no wagon roads in México one could travel in a carriage from the City of México to Santa Fé. In contrast with the plains and the at times barren districts of the plateau, the territory is occasionally broken by depressions called "barrancas," having in some instances a depth of 1,000 feet and being several miles in length. These are covered with a luxurious growth of trees and shrubs and watered by small streams running through the middle of the valley. Among the most remarkable are the Barranca

[a] See table on pages 408–409, Chapter XIX.

de Bertrán, on the western slope from Guadalajara to Colima, and the Mochitiltl from Guadalajara to Tepic.

Coasts.—The eastern coast of México, bathed by the Caribbean Sea and the Gulf of México, is flat, low, and sandy, except near the mouth of the Tabasco River, where, at some distance from the coast, appear the heights of San Gabriel, extending northeast and southwest for several miles. The coast on the Pacific side, though generally low, is here and there broken by spurs extending from the cordilleras to the ocean.

Gulfs and bays.—The principal gulfs are those of México, California, and the Gulf of Tehuantepec, the first named ranking among the largest in the world. The only bays worthy of notice are those of Guaymas, Santa Bárbara, Topolobampo, and Navachiste, in the Gulf of California; Concepción, La Paz, and Mulejé on the west coast of the same gulf; San Quintín, Magdalena, and Amejas, on the Pacific coast, in Lower California, and San Blas, and Valle de Banderas on the coast of Tepic.

Lakes.—The largest lake on Mexican territory is the Chapala Lake, measuring over 80 miles in length by 30 in breadth. The Valley of México has seven lakes, one fresh and six salt water, the three largest being Chalco, Xochimilco, and Texcoco. The other lakes in México are Catemaco, in the State of Veracruz; Cariel and Carpintero, in the State of Tamaulipas; Encantado, in Tabasco; Bacalor, in Yucatán; Alcuzague, in Colima; Cuitzéo, Tacascuaro, and Patzcuaro, in Michoacán; Yuriría, in Guanajuato, and Metztitlán in Hidalgo.

Islands.—México has a great many islands near the coasts, none of them very large and most of them uninhabited, although some are of great fertility and are capable of supporting a large population. Among the most important are El Carmen, the largest in the Gulf of México; San Juan de Ulúa and Sacrificios, opposite the port of Veracruz; Mujeres, in the Caribbean Sea; Guadalupe, about 75 miles from the west coast of Lower California; Tres Marías, a group off the same coast; the Revillagigedo group, near the coast of Colimas and Alcatraz Island, not far from the coast of the State of Michoacán.

HYDROGRAPHY.

The principal rivers of México are the Rio Grande, 1,500 miles long, forming, from El Paso, Tex., to the sea, the boundary line between the United States and México; the Lerma or Santiago, 540 miles long; the Mescala or Balsas, 426 miles in length; the Yaqui, 390 miles; the Grijalva, 350 miles; the Fuerte, 340 miles; the Usumancita, 330 miles, and several others. The topographical conditions of the country are such as to cause the streams, in their progress toward the sea, to be continually precipitated in the form of cascades, etc., thus rendering navigation exceedingly difficult on account of their varying depths,

but greatly facilitating their availability for motive power. The Rio Grande rises in Colorado (United States of North America), passes through New Mexico, and by the time it reaches Mexican territory is almost dry, as the inhabitants of both States have utilized the greater portion of its waters for irrigation purposes. After passing Presidio del Norte (Ojinaga), the river Conchos and other tributaries supply the Grande with water, thus enlarging its stream, though never to the extent attained before its passage through Colorado and New Mexico. The Mescala or Balsas River rises in the central plateau, near the Valley of México, passes through the State of Puebla to the southwest, and empties into the Pacific at Zacatula. This river is navigable for a short distance along its lower reaches; above the bar it is accessible to small craft. The Pánuco River rises north of the Valley of México, and under the names of Tula and Montezuma it describes a vast semicircular bend toward the west across the Hidalgo uplands and receives the streams of the Huasteca of Veracruz and Tamaulipas, beyond which it is joined by the various streams flowing from Querétaro, and finally empties into the Gulf of Mexico at the port of Tampico, which is at present the best harbor on the Gulf coast. The River Lerma, or Santiago, is also a considerable stream. It rises in the mountains southwest of Toluca, passes through the Lake of Chapala, which it leaves under the name of Guadalajara, changing again its name to Tololotlán and Santiago before it empties near San Blas, having received the waters of many tributaries. The Grijalva and Usumacinta rivers rise in the State of Chiapas, and, after being joined by many streams coming from Guatemala, empty into the Gulf of México at the city of Frontera, in the State of Tabasco. The Papaloapam rises in the State of Oaxaca, passes through the State of Veracruz, and empties into the Gulf of México at the town of Alvarado, a few miles south of Veracruz. There are also several other rivers more or less important. In all, there are in México 95 streams worthy of mention, their total extent being 32,400 kilometers, 10,000 of which are navigable for ships of great draft, 1,800 for canoes and small steamers not exceeding 3 feet in draft, and the remaining 10,600 kilometers are useless for navigation, but suitable for irrigating purposes and in many cases for motive power.

GEOLOGY.

"The geology of México[a] has been but imperfectly studied. In the higher ranges the prevailing formations are granite, which seem also to form the foundations of the plateaus, above which rise the traps, basalts, mineral-bearing porphyries, and more recent lavas. Hence Lyell's theory that México consisted originally of granite ranges with

[a] Coffee and India-rubber culture in Mexico; Matias Romero. New York, 1898, p. 12.

intervening valleys subsequently filled up to the level of the plateaus by subterranean eruptions. Igneous rocks of every geologic epoch certainly form to a large extent the superstructure of the central plateau. But the Mexican table-land seems to consist mainly of metamorphic formations which have been partly upheaved, partly interpenetrated and overlaid by igneous masses of all epochs and which are chiefly represented by shales, greywacke, greenstones, silicious schists, and especially unfossiliferous limestones. All these formations are alike remarkable for the abundance and variety of their metalliferous ores, such as silver, silver glance, copper, and gold. Gneiss and micaceous schists prevail in Oaxaca and on all the southern slopes facing both oceans. But the highest ranges are formed mainly of plutonic and volcanic rocks, such as granites, syenites, diorites, mineral-bearing trachytes, basalts, porphyries, obsidian, pearlstone, sulphur, pumice, lavas, tufa, and other recent volcanic discharges. Obsidian (itzli) was the chief material formerly used by the natives in the manufacture of their cutting implements, as shown by the quarries of the Cerro de las Navajas (Knife Cliff), near Real del Monte and Pachuca, in the State of Hidalgo. Vast deposits of pumice and the purest sulphur are found at Huichapam and in many of the craters. But immeasurably the most valuable rocks are the argentiferous porphyries and schists of the central plateau and of Sinaloa, unless they are destined to be rivaled by the auriferous deposits of Sonora. Horizontal and stratified rocks, of extremely limited extent in the south, are largely developed in the northern States and chalk becomes very prevalent toward the Rio Grande and Rio Gila valleys. To this chalk and to the sandstone are probably due the sandy plains which cover vast tracks in North México, stretching thence far into New México and Texas. Hence, the Bolsón de Mapimi, a vast rocky wilderness inhabited until recently by wild tribes, occupies a space of perhaps 50,000 square miles in Coahuila and parts of the surrounding States.

"None of the horizontal layers seem to be very rich in ores, which are mainly found in the metamorphic, Paleozoic, and hypogene rocks of Durango, Chihuahua, and the south. Apart from Sinaloa and Sonora, which are now known to contain vast stores of the precious metals, nearly all the historical mines lie on the south central plateau at elevations of from 5,500 to 9,500 feet. A line drawn from the capital to Guanajuato, and thence northward to the mining town of Guadalupe y Calvo of Chihuahua, and southward to Oaxaca, thus cutting the main axis of upheaval at an angle of 45°, will intersect probably the richest known argentiferous region in the whole world.

"Of other minerals the most important are copper, found in a pure state near the city of Guanajuato, and associated with gold in Chihuahua, Sonora, Guerrero, Jalisco, Michoacán, and elsewhere; iron in immense masses in Michoacán and Jalisco and in Durango, where

the Cerro del Mercado is a solid mountain of magnetic iron ore; lead associated with silver, chiefly in Oaxaca; tin in Michoacán and Jalisco; sulphur in many craters; platinum, recently found in Hidalgo; cinnabar, also recently found in Morelos and Guerrero; 'steppe salt' in the sandy districts of the north; 'bitter salt' at Tepayac and many other places; coal at various points; bismuth in many parts, marble, alabaster, gypsum, and rock salt in great abundance throughout the plateaus and sierra."

CLIMATOLOGY.[a]

The geographical position of México gives it a great diversity of climate. The heat of the torrid zone is experienced on the seacoast and the low, marshy tracts bordering on the Gulf of México, and in the valleys shut in by mountains 3,000 feet above sea level. The night breezes, however, bring compensation for the heat of the day, and the rains, which begin usually in June and last until November, are so abundant and fall so regularly that they refresh the atmosphere and are the main reliance of the agriculturist. So decided is the effect of the rains on the atmosphere that the seasons are divided into two only, viz, the rainy and the dry season. Trees are never entirely denuded of their foliage, but as each leaf falls through age it is immediately replaced by another, thus the bare autumnal limbs incident to northern climes are unknown.

The differences in climate, dependent upon the different degrees of altitude, are so great in México that the vegetable products of the country embrace all that can be found between the Equator and the Polar Circle.

The mean temperature in the hot regions varies from 77° to 82° F., and often rises to 100°, and in some coast localities to 105°.

The temperate zone lies between 3,000 and 5,000 feet above sea level. Here the mean temperature is from 62° to 70° F., the variation during the season being not more than 4° or 5°. This may be called the region of eternal spring. Semitropical productions have their homes here, mingled with the products of both the tropical and cold regions. In this privileged region both extremes of heat and cold are unknown and in it are found several cities, among others Jalapa and Huatusco, in the State of Veracruz, Chilpancingo in Guerrero, and Ameca in Jalisco. There are farms here where wheat and sugar cane grow on the same parcel of ground.

Between 7,000 feet above the level of the sea and greater heights lies the cold region, having a main temperature of from 59° to 60° F. Here the rainfall is five times less than in the temperate zone. The changes of temperature are but small from one end of the year to the other, although the diurnal changes between sunrise and sunset are often considerable.

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[a] See table on page 410, Chapter XIX.

The climatic conditions of México are undergoing great changes on account of the destruction of the forests. Rains were formerly very abundant and the atmosphere very moist, the country being covered with thick forests, but with the difficulty experienced in transporting the coal of the country, the population has had to depend entirely for their supply of fuel upon charcoal, thus denuding the mountains and changing very materially the climatic conditions of some regions. The case is different, however, in the lowlands, which are sparsely populated and where the country is still so thickly wooded that passage through them is impossible unless a path is made by felling large trees and clearing away the underbrush and weeds. In these regions mahogany, cedar, rosewood, etc., abound.

The most thickly populated region lies in the central plateau, high above sea level, and so well protected from the winds and storms by mountains that the climate is even, temperate, and delightful. The late Mr. Romero, from whose work, "Mexico and the United States,"[a] much valuable data have been procured in the preparation of this work, makes the following remark (p. 37): "The impression prevails in the United States that México, lying to the south and running toward the Equator, must be much warmer than this country; but this is not so. Even in warm places, like the lowlands on the coast, we do not have the extreme hot weather that is experienced in summer in the United States. The sea breezes refresh the atmosphere at night and cool it considerably, making, therefore, a very great contrast with the summer heat in this country. The medium climate of the valley of México, for instance, which is the one that has been best observed and understood, varies comparatively little between summer and winter, its greatest variations being between day and night on the same day."

It may be said that the climate of México, if not the most invigorating is, without doubt, one of the most delightful in the world. The region of temperate lands and oceanic slopes enjoys a perpetual spring, being exposed neither to the severity of the northern winter season nor to the extreme of summer heat.

FLORA.

The flora of México is unrivaled. It has been remarked that the most striking characteristic of the Mexican flowers is their rich color. The prevailing hue of the flowers is always rich and brilliant. There can be no more pleasing or extensive field for the botanist than the tropical forests of México, in whose deep shades bloom the most exquisitely tinted flowers and orchids. In the vicinity of Orizaba, a locality almost incomparable as regards the great variety of flowers, orchid collectors may find a paradise.

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[a] Published by G. P. Putnam's Sons, New York, 1898.

In the valley of México there is no day in the year that finds the markets wanting in beautiful roses and flowers to delight the eye and regale the senses, and the marvelous size the calla lilies, heliotrope, camelias, and poppies attain arrests wondering attention. There are about 50 varieties of lilies blooming in varied garb in this valley. Each belt—the hot, the temperate, and the cold—displays its own peculiar varieties of flowers, and in each has nature spread her most gorgeous colors, her fairest tints, and her sweetest perfumes.

The arboreal vegetation of the country embraces 114 different species of building and cabinet woods, among them being the pine, oak, fir, cedar, mahogany, rosewood, ironwood, etc.; 12 kinds of dyewoods; 8 of resinous trees—the cacao and india rubber, copal, liquid amber, camphor, turpentine, mesquite, dragon's blood, and the mastic. There are 17 varieties of oil-bearing trees and plants, among which are the olive, almond, sesame, flax, cocoa, palm, Peruvian balsam, etc.

The country is especially rich in medicinal plants, there being no less than 59 classified species of these, and many more still unclassified.

Fibrous plants abound and their products form a large proportion of the export trade. The best-known fibers are the heniquén or sisal hemp, the ixtle, pita, maguey, jute, flax, ramié, aloe, and cotton.

Of Mexican fruits and tobacco so much has been written that it is only necessary to say that through the diversified climate of that favored land it enjoys the fruits of every clime, and that these reach perfection in size and taste. The varieties are infinite. There are no less than twenty kinds of bananas. At the Philadelphia Commercial Museum, México had on exhibition 1,036 samples of her woods, 18 of dyewoods and substances, 68 of gums and resins, 369 of medicinal plants, and 152 of textile fibers. A great quantity of red cedar is exported from the State of Veracruz to the United States for the manufacture of cigar boxes. There is a sawmill in this State, owned by a German, which is engaged in cutting up red cedar logs for such use, having a capacity of 4,000 tons of lumber a year. At the Tennessee Centennial Exposition there were exhibited some bamboos from the State of Veracruz 40 feet in length. The local name for these giant bamboos is "tarros.

FAUNA.

The animal kingdom is almost as extensively represented in the territory of México as the botanical. There are three species of large felidæ—the puma, jaguar, and ocelot. Wolves, coyotes, and wildcats are numerous in the northern States. A specie of sloth inhabits the southern forests, which also contain five varieties of monkeys. Other wild animals are beavers, moles, martens, and otters. The armadillo and iguana are very common, and are used by some of the natives as food. Venomous serpents and noxious insects lurk in the forests of the hot lands. The mountains and foothills present a veritable par-

dise to the sportsman—deer, hare, rabbits, quail, wild pigeons, partridges, and an infinite variety of birds and ground game abounding. Horses, cattle, sheep, and goats are found almost everywhere, and are the source of much wealth and industry.

The birds of México are far famed for their brilliant plumage and singing qualities. In the hot lands the birds are more distinguished for beauty of plumage than melody of voice, their coloring being as varied as that of the flowers; but in the colder belts splendid songsters fill the air with thrilling notes. A list of the feathered inhabitants of the country includes 353 species.

Sperm and grayback whales, seals, and sea lions abound in the western waters of Lower California and in the gulf of that name. The waters of both coasts, as well as the rivers and mountain streams, teem with a great variety of fish.[4] Alligators infest the river mouths of both coasts. Turtles of all kinds are also found in abundance on the coasts. Tortoises exist in the waters of Yucatán and Lower California, as well as on the coasts of Sinaloa. The shell is an important article of export, amounting to about $20,000 a year. Near La Paz, in the Gulf of California, extensive beds of pearl oysters exist.

Señor Don Antonio García Cubas[5] mentions 52 varieties of mammal quadrupeds as existing in the Republic, and 293 varieties of fowls, including domestic fowls, as well as over 50 kinds of humming birds, differing in color and shape and forming a chromatic scale of brilliant tints, running from sea green through bluish green to emerald green, and from the lightest straw color to the deepest scarlet and fiery red. Of reptiles the authority cited enumerates 43 classes, and of batrachians 18 species.

Among insects, those claiming attention are the cochineal (Coccus cacti) and the honey bee, because of the excellent materials they produce beneficial to industry and to commerce. The former insect is cultivated in Oaxaca, living on the prickly-pear cactus, and producing a red liquid dye. Winterbotham, one of the last century's historians, in his history of America, relates that the trade in cochineal by the city of Oaxaca alone in the year 17— amounted to 200,000 crowns in value.

The bee is to be found all over México, busily producing great quantities of honey and wax.

The silkworm, although comparatively neglected, is said to yield an annual profit of $40,000.

The country offers a vast and rich field to the naturalist and entomologist for the study of the innumerable species of coleopter, there being no less than 77,000 of these cataloged.

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[4] Since 1881 the Government has devoted much attention to pisciculture. It established fish hatcheries and introduced large quantities of carp, trout, and salmon trout.

[5] Los Estados Unidos Mexicanos. 1885—Mexico.

CHAPTER I

HISTORICAL [illegible]

An impenetrable mist of fable [illegible] the early history of México. Scientific investigation and archeological research are not yet lifted the veil to disclose the original inhabitants of the country. Ruins and hieroglyphics in different portions of the Republic reveal the story of a series of immigrations from the north toward the south, but the point from which the movement began has not been determined.

Mexican historians generally agree, founding their theories on the interpretations of hieroglyphics and upon the ancient ruins, that the country was invaded by seven families successively immigrating from the north, all speaking the same language, the Nahuatl or Mexican. But history does not reveal the starting point of these races nor disclose the mystery of the multiplicity of languages of so diverse a character spoken by the many tribes that followed them, nor the causes that impelled them to abandon their former homes. According to the Mexican scholar Pimentel, not one of the 108 indigenous languages bears any analogy to Asiatic tongues, but certain resemblances in the language of the Esquimaux would indicate direct communication between Asia and America.

The annals of the Toltecs have furnished a starting point for the history of México. These composed a semicivilized nation who inhabited a country called Huehuetlapallan, toward the north of the continent, where they built cities and temples and were versed in agriculture, the arts and the computation of time. Owing to civil disturbances, the Toltecs, with a number of their partisans and neighbors, in the year 544 A. D., were expelled from their country and began their wanderings southward, founding cities on their way.

One hundred and seventeen years after leaving their country they reached the present site of Tula (50 miles north of the City of México, on the line of the Mexican Central Railroad), where they laid the foundation of their powerful kingdom. This tribe remained here until overthrown by the "lords of Jalisco," in 1116, eleven "monarchs" having reigned.

There is a notable event in the history of the Toltecs which deserves mention, as it is well authenticated. It is the origin of the universal and famous beverage pulque in the reign of the eighth Toltec

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[b] Los Estados Unidos Mexicanos, 1893—México.

CHAPTER II.

HISTORICAL SKETCH.

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chief, Tepaucaltzin, in the latter half of the eleventh century. It is narrated that a noble named Papantzin discovered the method of extracting the juice of the maguey plant, of which it is made, and sent some of the fermented liquid to his chief by the hand of his daughter, the beautiful Xochitl, called the Flower of Tollan (Tula). The chief, enamored both of the drink and the maiden, retained the latter a willing prisoner, and she became the mother of his illegitimate son, who afterwards wielded the scepter. This incident inaugurated the troubles of the Toltecs.

After the dispersion of the Toltecs, a roving tribe, the Chichimecas, hearing of the former's overthrow, occupied the abandoned country, starting for it from the north in 1117.

Other tribes of the original seven successively descended from the north and spread themselves over the valley of México, founding cities and erecting temples and palaces.

The last tribe to reach the valley was the Aztec, or Mexican, whose annals claim the greatest interest in the history of México. This tribe is supposed to have originally come from the north of California, according to the historian Clavijero, their country being called Aztlan. They reached Tula in 1196, remaining there nine years, and spending eleven in other parts of the valley. At the expiration of this time they arrived in Zumpango, 30 miles north of their future capital. Here they were well received, and the chief's son married a daughter of one of the Mexican families. From this marriage sprang the military chiefs of the Mexicans.

After many wanderings they settled on the marshy islands near the western borders of Lake Texcoco, and there, in the year 1325, was established the nucleus of the city first called Tenochtitlan, derived, according to some authorities, from Tenoch, one of their priests and leaders. Other authorities claim that the name comes from Tenuch (prickly-pear cactus), as there is an old legend that the leaders of the tribes of Mexicans, wandering in search of a place of rest, saw an eagle standing upon a cactus strangling a serpent on the site of the City of México. This legend has been generally accepted, and gave México the design for its escutcheon. The present name of the city finds its source in the name of the Aztec's god of war Mexitli, also known as Huitzilopochtli. The name of the country demonstrates the hold the maguey plant had upon the ancient tribes. Mexican traditions, as preserved in the most ancient writings, relate that this god Huitzilopochtli was born of a virgin belonging to the noble family of Citli (free and ancestral); that his cradle was the heart of a maguey plant (metl), and hence the name of Mecitli, afterwards changed into Mexitli, and finally into México.

Here the Aztecs constituted their first government, which was theocratic and military, under Tenoch, who died in the year 1343. Three

years subsequent to his death the form of government changed, and in 1376 the first king was elected. Ten kings followed, during the reign of which the Aztecs devoted themselves to the arts of peace and built a fine city, connecting it with the mainland by four causeways. The last of the Aztec monarchs was Cuauhtemoc, whose conquest by Hernando Cortés brought an end to the Mexican dynasty.

Cortés landed on the island of San Juan de Ulua, in Veracruz Harbor, on the 21st day of April, 1519, and in two years, August 13, 1521, had captured the City of México and unfurled the flag of Spain over the palace of Moctezuma.

Under the name of New Spain, México was ruled from 1521 to 1821 successively by five governors, two royal commissioners (*audiencias*), and sixty-two viceroys, the last of whom, Juan O'Donojú, did not assume control.

During the administration of the first viceroy, Don Antonio de Mendoza, who ruled from 1535 to 1550, discoveries were actively prosecuted in the north, the first money was coined in México, the University of México and several colleges were founded, and the first printing press in the New World was introduced. The School of Mines, which is still standing, and yearly graduating talented men, was founded by the viceroy the Marquis of Branciforte. The construction was begun in 1797, and the building was completed in 1813. Its total cost was about $2,000,000.

The modern history of México and the commencement of the almost continuous internecine wars may be said to date from the "grito de Dolores" on the night of the 16th of September, 1810, by the parish priest of Dolores, Don Miguel Hidalgo y Costilla, who gathered about him many trusty followers under his banner to the cry of: "Long live religion! Long live our Most Holy Mother of Guadalupe! Long live America, and death to bad government!" This cry is what is known as "el grito de Dolores."

Several efforts to cause a rebellion against the Spanish authorities had been made previous to this date, in fact ever since 1798, during the incumbency of the forty-fifth viceroy, Miguel José de Azanza, but they were all suppressed.

Hidalgo marshaled a considerable force and was victorious in several engagements, but he and his lieutenants—Allende, Aldama, and Jimenez—were captured and put to death in 1811, the first on the 31st of July and the three last-named on June 26. The bullets that crashed through these patriotic breasts terminated the first stage of the war for independence.

One of the greatest figures in Mexican history then came to the front, José María Morelos y Pavón, the parish priest of Carácuaro, who by his audacity, valor, and military sagacity was accorded a position at the head of the leaders of the cause of independence. After

many notable engagements, in which he was almost always victorious, he captured Acapulco on April 12, 1813, thus ending his second campaign. On the 14th of September, 1813, in the town of Chilpancingo, the first Mexican Congress was installed, which two months later (November 6) issued the declaration of independence and decreed the emancipation of the slaves. The first provisional constitution was adopted October 22, 1814.

Morelos was eventually overcome by being betrayed by a deserter from his ranks named Carranco, was taken to México, tried, and sentenced to be shot. The sentence was carried out at San Cristobal Ecatepec on the 22d of December, 1815.

But the cause of independence was still sustained by many leaders in different parts of the Republic, among them being Francisco Javier Mina, a Spanish officer, who resolved to do battle for the independence of México. He disembarked at the port of Soto la Marina on April 15, 1817, with 500 men recruited in the United States, and marched rapidly into the interior, gaining many victories. He was apprehended at the ranch called Venadito, and was shot the 11th of November, 1817. Many other patriot chiefs arose to lead the independent movement, but most of them met the fate of their predecessors. Among these was Guerrero, who, after many hazardous exploits and brilliant achievements, finally, on the 10th of January, 1821, held a conference with Agustín de Yturbide, brigadier-general in command of the royalist forces, at Yturbide's request, and the two leaders agreed to proclaim independence. The latter proclaimed what is known as "The Plan of Iguala," on February 24, 1821.

Yturbide, then assuming command of the forces, marched on México, making Valladolid (now Morelia), Querétaro, and Puebla capitulate on the way. On reaching México the Viceroy Apodaca was deposed July 5, 1821.

The sixty-second and last viceroy, Juan O'Donojú, arrived at Veracruz on the 30th of July, and, upon hearing of the condition of affairs, issued a proclamation and entered into communication with the independents. Yturbide went to Córdoba, where a conference was held, resulting in the treaty of Córdoba, which, with slight modifications, confirmed the plan of Iguala, and Spanish domination in México, which had lasted three hundred years, closed forever when, on the 27th of September, 1821, Yturbide made his triumphal entry into the capital.

The second Mexican Congress, the first after securing independence, met on February 24, 1822, and elected Yturbide Emperor on the 19th of May of the same year. He was crowned and anointed with great pomp and ceremony in the great cathedral of the capital on the 21st of June following as Agustín I, Emperor of México. His reign was short. The people who had been warring so long could not settle

AMERICAN COLONY IN THE CITY OF MÉXICO.

down to peaceful pursuits. Ambitious leaders thirsted for high places, and the smoke of the battles for independence had scarce lifted before General Santa-Anna headed a revolutionary movement in Veracruz, proclaimed a republican form of government, and compelled Yturbide to abdicate and leave the country. He became desirous to revisit it, and, returning to México, was arrested immediately upon disembarking, taken to Padilla, brought before the legislature of Tamaulipas in session there, and by that body condemned to death. He was shot July 19, 1824, just five days after landing.

The Federal Republic was established on the ruins of the Empire. The third Mexican Congress assembled November 7, 1823, and proclaimed on October 4, 1824, a republican constitution, which was patterned closely upon that of the United States. The first President of México, the patriot Gen. Guadalupe Victoria, took the oath of office on October 10. Congress was dissolved December 24, 1824, and the first constitutional Congress convened January 1, 1825. During this year England and the United States formally recognized México.

Independence being secured, two parties came into existence—the Spanish, which became the Centralists, and the Republicans, who became Federalists. To this division is due the constant internal disturbances and agitations in México from 1828 to 1846. During this period five radical organic changes swayed the people between centralism and federation.

The two parties succeeded each other in power, mostly through revolutions, until 1847, when the war with the United States, which had commenced the year previous, ended and the latter nation acquired more than two-fifths of the Mexican territory. After the declaration of peace between the two countries the Mexican Liberal party remained in power (except from 1853 to 1855, when General Santa-Anna governed as Dictator), carrying out its theories of government. In the year 1857 the Constitution now in force in México was framed by a constitutional assembly.

In 1861 England, Spain, and France formed an alliance to declare war against México, but the alliance had been scarcely perfected when the two first-named powers withdrew and France was left alone in the enterprise. War between the two nations lasted from 1862 until 1867 without the French gaining any decided foothold.

Possessing themselves finally of the capital, they established an empire, aided by a number of disaffected Mexicans, and placed the crown upon Maximilian of Hapsburg, Archduke of Austria.

The Archduke arrived in the city of México on June 12, 1864, accompanied by his wife, Carlota, daughter of Leopold I, King of the Belgians. These two unfortunate beings were crowned Emperor and Empress of México with great solemnity in the cathedral and ruled a portion of the country until 1867.

Maximilian, bereft of the aid and protection of the French, intrenched himself in Querétaro, where he was made prisoner by the Republicans and shot, together with the Imperialist Generals Miramón and Mexía, at the Cerro de las Campanas, the 19th of June, 1867.

Benito Juarez, of Indian birth, and possessed of great ability, patriotism, and energy, was the President of the Republic during the turbulent times of the reformation and the war with France. He entered the capital victorious on the 15th of July, 1867, and retained the Presidency until his death, in 1872, being the only Mexican who has died during an occupancy of that office. His immediate successor was Sebastián Lerdo de Tejada, who retained the office until 1876, when he was unseated by the revolution of Palo Blanco. Gen. Porfirio Díaz succeeded Lerdo de Tejada in May, 1877, and was followed by Gen. Manuel Gonzales in 1880. In 1884 General Díaz was elected to a second term, and has since continued at the head of the Government. His administration has been attended with great progress and prosperity.

The governments of México since the securing of independence have been as follows:

Regencies.—(1) Composed of Generalísimo Don Agustín de Yturbide, Don Juan O'Donojú, Don Manuel de la Bárcena, Don Isidro Yañez, and Don Manuel Velasquez de Léon, 1821 to 1822. (2) Don Agustín de Yturbide, Don Isidro Yañez, Don Miguel Valentín, Count de Casa de Heras, and Brig. Gen. Don Nicolás Bravo, 1822.

Empire.—Yturbide, with the title of Agustín I, 1822 to 1823.

Provisional Governments.—The council charged with the supreme executive power, composed of Don Nicolás Bravo, Don Guadalupe Victoria, and Don Pedro Negrete, with Don José María Michelena and Don Miguel Dominguez as substitutes, 1823 to 1824.

Federal Republic.—Gen. Guadalupe Victoria, 1823 to 1829; Gen. Vicente Guerrero, 1829; Don José María Bocanegra, 1829; Don Pedro Velez, President of the Supreme Court of Justice, Gen. Luis Quintanar and Don Lucas Alamán, 1829; Gen. Anastacio Bustamante, 1830 to 1832; Gen. Melchor Musquíz, 1832; Gen. Manuel Gomez Pedraza, 1832 to 1833, Don Valentín Gomez Farías, 1833; Gen. Antonio Lopez de Santa-Anna, 1833; Don Valentín Gomez Farías, 1833 to 1834; Gen. Antonio Lopez de Santa-Anna, 1834 to 1835; Gen. Miguel Barragán, 1835 to 1836; Don José Justo Corro, 1836 to 1837.

Central Republic.—Gen. Anastacio Bustamante, 1837 to 1839; Gen. Antonio Lopez de Santa-Anna (substitute), 1839; Gen. Nicolás Bravo (substitute), 1839; Gen. Anastacio Bustamante, 1839 to 1841; Don Javier Echeverría, 1841.

Dictatorships.—Gen. Antonio Lopez de Santa-Anna, 1841 to 1842; Gen. Nicolás Bravo, 1842 to 1843; Gen. Antonio Lopez de Santa-Anna, 1843; Gen. Valentín Canalizo, 1843 to 1844.

Central Republic.—Gen. Antonio Lopez de Santa-Anna, 1844; Gen. Valentín Canalizo, 1844; Gen. José Ignacio Herrera, 1844 to 1845; Gen. Mariano Paredes y Arrillaga, 1846; Gen. Nicolás Bravo, 1846.

Federal Republic.—Gen. Mariano Salas, 1846; Don Valentín Gomez Farías, 1846 to 1847; Gen. Antonio Lopez de Santa-Anna, 1847; Gen. Pedro María Anaya, 1847; Gen. Antonio Lopez de Santa-Anna, 1847; Don Manuel de la Peña y Peña, President of the Supreme Court of Justice, 1847; Gen. Pedro María Anaya, 1847 to 1848; Don Manuel de la Peña y Peña, 1848; Gen. José Joaquín de Herrera, 1848 to 1851; Gen. Mariano Arista, 1851 to 1853; Don Juan B. Ceballos, President Supreme Court of Justice, 1853.

Dictatorships.—Gen. Manuel María Lombardini, 1853; Gen. Antonio Lopez de Santa-Anna, 1853 to 1855; Gen. Rómulo Díaz de la Vega, 1855; Gen. Martín Carrera, 1855; Gen. Juan Alvarez, 1855; Gen. Ignacio Comonfort, 1855 to 1857.

Constitutional Presidents.—Gen. Ignacio Comonfort, 1857 to 1858; Don Benito Juarez, President of the Supreme Court of Justice, 1858 to 1861. Don Benito Juarez (elected), 1861 to 1872; Don Sebastián Lerdo de Tejada, President of the Supreme Court of Justice, 1872; Don Sebastián Lerdo de Tejada (elected), 1872 to 1876; Gen. Porfirio Díaz (provisional), 1876; Gen. Juan N. Mendez (substitute), 1876; Gen. Porfirio Díaz (elected), 1877 to 1880; Gen. Manuel Gonzalez, 1880 to 1884; Gen. Porfirio Díaz, 1884 to 1888; Gen. Porfirio Díaz, 1888 (still in office).

During the years from 1857 to 1860, in the capital of the Republic, which at the time was in the power of the Conservative party, there governed in the capacity of Presidents the following persons:

Gen. Felix Zuloaga, 1857; Gen. Manuel Robles Pezuela, 1858; Don José Ignacio Pavón, 1858; Gen. Miguel Miramón, 1858, Gen. Felix Zuloaga, 1859; Gen. Miguel Miramón, 1859 to 1861.

As a result of the French intervention, the Imperial Government was established from 1864 to 1867.

While awaiting the arrival of the Archduke Maximilian of Austria, Bishop Juan B. Ormachea and Generals Juan N. Almonte and Mariano Salas governed as regents.

CHAPTER III.

ETHNOLOGY AND ARCHÆOLOGY OF MÉXICO.

By Otis T. Mason.

Curator of the Division of Ethnology in the United States National Museum.

No attempt is here made to resolve into its constituent ethnic elements that remarkably composite people which first set eyes on Yucatán in 1517. Suffice it to say that Iberian, Semite, Hamite, Goth and Vandal, Roman and Celt had mingled their blood in that stream of brave and adventurous men. From remotest time Spain had been the meeting ground of races, of peoples, of languages, and of religions. One does not know which to admire more—the brilliant recklessness of the soldier or the fiery zeal of the priest. The Mexican of to-day has the blood of more races in his veins than any other American, and as the present Indian population is largely metis, what a compound of races! "No other portion of the globe," says H. H. Bancroft (1874, ii, 87), "embraces within equal latitudinal limits so great a variety of climate and vegetation as México." It is also true that within the area of the original territory there were more families of native languages than in all the Western Hemisphere besides; and, to complete the chain, there were more kinds and grades of culture there. The Seri Indians, of Sonora, are as abject as the Fuegians, while the Nahuatl and Maya speaking tribes of the valley of México and of Yucatán occupied the most elevated position for culture in the New World.

The origin of the Mexican aborigines is involved in that of the American Indians, since within the present boundaries of that Republic are gathered representatives of every zone, from the Apache, an Athapascan, whose principal home is in Alaska, to the tribes of Oaxaca and Chiapas, who are the children of a torrid clime. There are now in México ten times more Indians than were ever at any time within the United States domain. In the works of Orozco y Berra (1864), Pimentel (1862), and Alfonso L. Herrera (1895) the reader will find complete lists of all tribal names. These include, often, several titles for the same tribe, to wit, their own name, by which they call themselves; their place name, as we now mark persons by the town where they live; names, often of contempt, by which a tribe is designated among its neighbors, besides titles conferred through mistake by ignorant observers. From among all these bewildering designations the following are selected. The linguistic families are

marked by the termination -an, after the example of the Bureau of American Ethnology. In assigning tribes to their stocks frequent references are made to Brinton (1891) and Gatschet (1885). The last-mentioned authority has given most personal study to the Nahuatlan family since Buschmann (1859).

Mention must also be made of the linguistic map in Cubas (1876) and to Keane (1878). In the table the family names of Pimentel appear in the order followed by the author. On the right is given the abbreviated form here adopted. The numbers in the margin are Pimentel's. Following this list of families another will be found, in which the States of the Republic wherein the families chiefly reside accompany the name of each. It is quite possible that these may need emendation, but the information here given is the best at hand.

Linguistic families in México.

Pimentel's list (1862).	Author's list (1900).	Census in 1895.
Mexicana	Nahuatlan	1,750,000
Sonorense Opata-Pima	Piman	85,000
Guaicura[a] y Cochimi-Laimon	Yuman	2,500
Seri	Serian	200
Tarasca	Tarascan	250,000
Zoque-Mixe	Zoquean	60,000
Totonaca	Totonacan	90,000
Mixteco-Zapoteca	Zapotecan	580,000
Matlalzinga o Pirinda	Otomian (not certain)	5,000
Maya-Quiché	Mayan	400,000
Chontal (not a family name)	Tequistlatecan (?)	31,000
Huave	Huavan	3,800
Apache	Athapascan	8,000
Othomiés	Otomian	704,734
Total		[b]3,970,234

[a] Guaicura may be a separate family.
[b] These numbers are not accurate, but serve for comparison.

LOCATION OF MEXICAN LINGUISTIC FAMILIES.

Nahuatlan or Mexican family.—Aguascalientes, Colima, Federal District, Guerrero, Hidalgo, Jalisco, México, Michoacán, Morelos, Oaxaca, Puebla, Sinaloa, Tabasco, Tlaxcala, Veracruz.

Piman family.—Made a subfamily of Nahuatlan by Buschmann (1859), Gatschet (1879), and Brinton (1891); Chihuahua, Durango, Jalisco, Sinaloa, Sonora, Zacatecas.

Yuman family.—Northern part of Lower California.

Serian family.—Sonora, Tiburón Island.

Tarascan family.—Michoacán, a few in Guerrero and Jalisco.

Zoquean family.—Oaxaca, chiefly; also Guerrero and Puebla.

Totonacan family.—Northern part of Puebla and Veracruz.

Zapotecan family.—Chiefly in Oaxaca; also in Guerrero and Puebla.

Mayan family.—Yucatán, Chiapas, and Veracruz.

Tequistlatecan family.—Oaxaca (Brinton, 1891, p. 148).

Huavan family.—Chiapas.

Athapascan family.—Chihuahua and Sonora. Apache intruders from United States.

Otomian family.—Guanajuato, Hidalgo, Querétaro, San Luis Potosí, Michoacán. The Chontals of Oaxaca and Guerrero are placed by Brinton in a provisional family, which he names Tequistlatecan, and puts the Triquis in the same. The Chontals of Tobasco are Mayan (1891, p. 146). Matlalzinca may be a family. Not in Pimentel's list are the Chinantecan family, in Oaxaca; the Chiapanecan family, in Chiapas, and a remnant of the Tañoan family, in Chihuahua.

A glance at the table of linguistic families shows their relative importance. The census is from Herrera (1895), and may be defective, but is correct enough to exhibit the relative importance of these families in the past and present history of México. Those that were, in fact, the predominant factors in that culture were, proceeding southward from the boundary line of the United States, as follows:

Piman, the Opata-Pima of the later Mexican authorities, occupy the western northern States as far south as Guadalajara, lying along the Gulf of California, except where they are cut off by the Seri, but they do not anywhere approach the ocean, being intercepted by the Nahuatlan tribes. Eminent authorities, among them Buschmann (1854), Gatschet (1876), and Brinton hold the Piman to be a branch of the Nahuatlan family, including the Shoshonean in the United States (Powell, 1891, p. 108), the Sonoran or Opata-Pima (Brinton, 1891), and the Nahuatl or southern branch. This stock now occupies the site of the Casas Grandes and other adobe ruins, and it is reasonable to suppose that their ancestors were the builders and inhabitants of many ancient pueblos and cliff sites, both in Arizona and northern México. (Bandelier, 1890.)

Nahuatlan.—Following the Bureau of American Ethnology in keeping the Piman as a separate family leaves the Nahuatlan free to include only Pimentel's Mexicana. The tribes of this stock are found in almost unbroken continuity from Sinaloa along the Pacific slope to the border line of Guatemala. In the valley of México they occupied three districts, Tezcuco, Tlacopán, and Tenochtitlán. This family holds the most prominent position in the history of the Conquest. (Thomas, 1898, 233; Bancroft, 1875, ii, 133; Cubas, 1876.)

Otomian, a widely spoken language formerly. The tribes were among the earliest in the valley of México, and they spread themselves out over Guanajuato, Hidalgo, Querétaro, San Luis, and Michoacán.

Tarascan, inhabitants of Michoacán. The Tarascos were builders in stone, metal workers, and most excellent weavers. (Leon, 1874.)

Totonacan, of Veracruz, the first natives encountered by Cortés. (Thomas, 1898, 332.)

Zapotecan, the Mixteco-Zapoteca, of Pimentel, are in Oaxaca and Guerrero. The ruins of Mitla are within their territory, with their

wonderful artificial hills, stone buildings, fretworks in cut stones, columns, and wall paintings. (Holmes, 1897, 227, quoting Charnay and Bandelier.)

Zoquean, Zoque-Mixe family are in Chiapas, Oaxaca, and Tabasco, between the Mayan and the Zapotecan tribes. Little is known of their origin, save a tradition of their having come from the South. If their ancestors were ever possessed by the spirit of culture progress, once so exalted here, the pride of former days now sleeps "as though that soul were dead."

Mayan family, the advance guard of new world progress. Scholars have consecrated their lives worthily to the Maya civilization. After Bancroft (75, ii, 630–805) consult Holmes (1895, pt. i), Brinton (91, 153–159, with notes), Thomas (1899), Seler (1887), Maudslay (1897), Förstemann (1890), Gunckel (1897).

The Mayas, excepting a colony of Huastecas, on the Rio Panuco, in Veracruz, lived together in Yucatán, Guatemala, and Honduras (Stoll, 1884, 180 pp.). To them may be assigned the wonderful ruins of Palenque in Chiapas, of Copán in Honduras, of Uxmal and Chichen-Itza in Yucatán.

The following tribal names have been selected out of the many hundreds of designations before mentioned because it seemed possible to assign these to their linguistic families and locations. The list will at least form a working basis for future inclusions and exclusions:

ABORIGINAL TRIBES IN THE REPUBLIC OF MÉXICO, TOGETHER WITH THEIR LINGUISTIC FAMILIES AND LOCALITIES.

Acaxees (Nahuatlan F.), Sinaloa, Durango.

Acxotecas (Nahuatlan F.), México, ancient division of Chichimecs.

Acolhuas (Nahuatlan F.), México, ancient ruling tribe, Colhuas.

Agualulco (Nahuatlan F.), Tabasco, also Ahualulco.

Ahomaos (Piman F.), Sinaloa, also Ahomes.

Aicales (Mayan F.), Chiapas, dialect of Chol., see Mopanes.

Ajoyes (Mayan F.), Chiapas, dialect of Chol., also Axoyes.

Alames (Mayan F.), Chiapas.

Alasapa (Coahuiltecan F.), Coahuila, N. Leon.

Amuchgos (Zapotecan F.), Guerrero, also Amusgos.

Apache (Athapascan F.), Northern boundary; the Apaches of Yuma affinity are all in the United States.

Aripas (Yuman F.), Lower California, branch of Waikuru.

Ateacaris (Nahuatlan F.), Jalisco, Cora proper.

Aztecas (Nahuatlan F.), Mexicans of Anahuac. Seven tribes came from Aztlan in the north, and the Aztecs were one of them. They arrived in the following order: Sochomilcos, Chalcas, Tepanecos, Tescucans, Tlatluicans, Tlascalans, Mexicans or Aztecas.

Babiocora (Piman F.), branch of Teguima, Teguis.

Basirora (Piman F.), Sonora, Sinaloa.

Batucari (Piman F.) Sinaloa.

Batucos (Piman F.), Sonora, division of Teguis.

Benixonos (Zapotecan F.), same as Cahoncos or Nexicha.

Biara (Piman F.), Sinaloa, dialect of Tehues.
Cahita (Piman F.), Sonora, Sinaloa, include Yaquis, Mayos, Tehuecos, Zuaques.
Cajonos (Zapotecan F.), same as Benixonos.
Cátuxanos (Coahuiltecan F.), Coah., Tam., also Catuxanos.
Ceris, same as Seris.
Coahuiltecan Family, Texas and N. E. México; also Texan.
Coahuiltecos (Coahuiltecan F.), Coahuila.
Cochimis (Yuman F.), north and middle California peninsula.
Cocomaricopas (Yuman F.), Maricopas, Pina agency, Ariz.
Cocomes (Mayan F.), said to be in Yucatán.
Cocopas (Yuman F.), both sides of Colorado mouth; river and mountain tribes.
Coguinaches (Piman F.), Sonora, division of Opata.
Cohuixcas (Nahuatlan F.), Guerrero.
Colothans (Nahuatlan F.), name of country for Coras, Zac., Jalisco.
Comanche (Shoshonean F.), northern border of Mex., now in Oklahoma.
Comitecos (Mayan F.), Chiapas; Chañabal of Comitán.
Comecrudos (Coahuiltecan F.), Tamaulipas, wrongly Carrizos.
Comeyas (Yuman F.), southern California, probably Dieguefios.
Comoporis (Piman F.), Sinaloa.
Comoyei (Yuman F.), between Colorado River and ocean; Comeya, Quemaya.
Comuripas (Piman F.), Sonora.
Conchos (Yuman F.), California, branch of Guaicuru.
Conchos (Coahuiltecan F.), Chihuahua.
Corarus (Nahuatlan F.), Jalisco.
Coras (Nahuatlan F.), Jalisco, in Sierra del Nayarit.
Coras (Yuman F.), Lower California.
Cotoname (Coahuiltecan F.), Tamaulipas.
Coviscos (Zoquean F.), Puebla, Cahuixcas, dialect of Mixe (Brinton).
Coyoteros (Athapascan F.), northern boundary; now Arizona.
Cuchan (Yuman F.), Yuman proper, in Arizona and California, south part of state.
Cuicatecos (Zapotecan F.), Oaxaca.
Cuitlatecos (Nahuatlan F.), Guerrero, Michoacan, Tecos; also Popolocas.
Culuas (Nahuatlan F.), México; Colhuas, identified with Tezcucans.
Chalcas (Nahuatlan F.), México, also Chalcotecanos; around the lake of Chalco, "where sand is."
Chalqueños (Nahuatlan F.), México; same as Chalcas.
Chamules (Mayan F.), Chiapas, are Tzental.
Chañabales (Mayan F.), Chiapas; Comiteco, Jocolobal.
Changuaguanes (Athapascan F.), Chihuahua.
Chapanecos (Chiapanecan F.), Chiapas., Mangues in Nicaragua.
Charaeos (Otomian F.), Michoacán; Pirindas.
Charenses (Otomian F.), Michoacán; Pirindas.
Chatinos (Zapotecan F.), Oaxaca and Chiapas.
Chayopinos (Coahuiltecan F.), Coahuila.
Cheles (Mayan F.), Yucatán.
Chiapanecan family, with remnants in Chiapas.
Chichimecos, ancient tribe of México, not a family; Brinton, 1894, 129; some were Nahuatlan, some Otomian.
Chilpaines (Athapascan F.), Coahuila.
Chimalapas (Zoquean F.), Tehuantepec.
Chimalpanecs (Nahuatlan F.), ward of Tezcuco.
Chinantecan family, Oaxaca; Tenez, Teutecas, Tzinantecos; Brinton, 1894, 144, 158.
Chinarras (Nahuatlan F.) Chihuahua; Humas.
Chinipa (Piman F.), Chih., div. of Tarahumara; see Varogio.

Chinquímes (Zoquean F.), Puebla, Guerrero, Tlapanecos, possibly the ancient Xiximes.

Chochona (Zapotecan F.), Oaxaca. Put also with Tlapaneco.

Choles (Mayan F.), Chiapas.

Chorotegas (Chiapanecan F.), or Cholutecas; Nicaragua.

Chuchones (Zapotecan F.), Oaxaca, Guerrero.

Cuitlatecos (Nahuatlan F.), tribe of Mexicans, "dunghill people."

Chontals, non-Nahuatl tribes; the word means "outcasts;" Brinton, 1894, *s. v.*

Chontals (Mayan F.), Tabasco; identified with Tzental.

Chontals (Tequistlatecan F.), Oaxaca; Brinton; Belmar makes them Zapotecan.

Dohmes (Piman F.), Sonora, Dohemabatuco; see Eudeve; is probably a local name.

Eudeves (Piman F.), Sonora; branch of Opatas.

Guaicuru (Yuman F.), Lower California; may be a separate family (Gatschet).

Guailopos (Piman F.), Chihuahua; see Chinipas.

Guaymas (Piman F.), Sonora.

Guazapari (Nahuatlan F.), Chihuahua.

Heve (Piman F.), Sonora; see Doheme, Eudeve.

Hichucios (Piman F.), Sinaloa, dial. of Tehueco.

Himeris (Piman F.), Sonora.

Hizos (Piman F.), Chihuahua.

Huastecas (Mayan F.), Veracruz; Huaxtec.

Huavan family, Tehuantepec; also written Huavi, Wabi.

Huaxtontecos (Huavan F.), Tehuantepec.

Huicholes (Nahuatlan F.), Zacatecas, Jalisco.

Huites (Nahuatlan F.), Sinaloa.

Humas (Nahuatlan F.), Chihuahua; Chinarras.

Humes (Nahuatlan F.), Durango; Hiumi (Latham), Acaxé.

Husorones (Piman F.), Chihuahua, dial. of Tarahumara.

Ipapanes (Totonacan F.). Keane puts with Huaxtec.

Itza (Mayan F.), Yucatán, Chichen-Itzae; Itzalanos.

Jaripecha (Tarascan F.), Guanajuato.

Jocolabal (Mayan F.), Chiapas; Chañabal.

Jonaz (Otomian F.), Guanajuato, Querétaro.

Jopes (Zoquean F.), Chiapas; Tlapanecos, Yopes.

Jovas (Piman F.), Sonora; Jobas, Ovas, dial. of Opata, perhaps the same as the Eudeves or Heves.

Juaves, same as Huave, Huavan family.

Kupules (Mayan F.), Yucatán.

Kutchan (Yuman F.), Lower Colorado River; Ko-Utchan, Cutganes.

Lacandones (Mayan F.), Chiapas, not a language (Berendt).

Laimones (Yuman F.), Cal. peninsula, with Cochimi.

Matapanes (Piman F.), Sinaloa.

Matlalzincos, or Matlalzingas, Nahuatl name for Pirinida. May be a family (Saville).

Matlames, same as Matlalzincos, with ending-tzin removed.

Maya (Mayan F.), Yucatán, Tabasco, and Chiapas.

Mayan family. All over southeastern México.

Mayos (Piman F.), Sonora, subtribe of Cahita.

Mazahua (Otomian F.), southwestern part of valley of México; Michoacano.

Mazapil (Nahuatlan F.), Zacatecas.

Mecos (Otomian F.), Zacatecas; see Jonaz, Serrano. Mecos seems abbreviation of a *longer* tribal name, as with Teco, Tecos.

Mazatecos (Zapotecan F.), Oaxaca; anct. Mazatlán.

Mecos (Otomian F.), Guxanajuato; see Jonaz.

Mexicanos (Nahuatlan F.). The southern Nahuatlan tribes, so called.

Meztitlatecas (Nahuatlan F.), México.

Michoas (Tarascan F.), Michoacán.

Mijes (Zoquean F.), Oaxaca; also Mixes.

Mimbreños (Athapascan), Sonora, or Arizona.

Mixtecos (Zapotecan F.), Oax., Pueb., Guer., Miztoguijxi.

Monquies (Yuman F.). See Waicuru.

Mopanes (Mayan F.), Chiapas, are Choles. This problematic tribe probably speaks Maya.

Muutzizti (Piman F.), Jalisco, branch of Cora, Muutzicat.

Nahuatl and Nahua, instead of Aztec or Mexican, the "national" designation; divided into northern, or Piman (Sonoran), and southern, or Mexican (Gatschet).

Nahuatlan family includes all so-called Uto-Aztecan tribes in México.

Naolingos (Totonacan F.), Veracruz, Puebla.

Nayaritos (Nahuan F.), same as Coras.

Nevomes (Piman F.), Sonora.

Netzichos (Zapotecan F.), Oaxaca; also Nexitzas.

Niquiran (Nahuatlan F.), México.

Ocotlanos (Zapotecan F.), Oaxaca.

Olmecas, preceded fabled Toltecs in México. Language unknown.

Onaras (Piman F.), Sonora, branch of Opatas. The name means "salt."

Opata (Piman F.), Sonora, Rio Yaqui.

Otomi (Otomian F.), Middle States, many spellings. México, Veracruz, Pueblo, Tlaxcala, Querétaro, Guanajuato, San Luis, Michoacán.

Pacheras (Piman F.), Chihuahua, branch of Tarahumara.

Pames (Otomian F.), México, Querétaro, Guanajuato, Nuevo Leon, San Luis.

Pantecos (Mayan F.), Veracruz, are Huaxtecs.

Papagos (Piman F.), Sonora, some in Arizona (southern).

Pauzanes (Coahuiltecan F.), Coahuila.

Pericúes (Yuman F.), Lower California.

Pihiques (Coahuiltecan F.), Coahuila, México.

Pimas (Piman F.), Sonora; P. Altos and P. Bajos.

Pinomes (Zoquean F.), Tabasco, Oaxaca, Chiapas; Tlapanecos.

Pirindas (Otomian F.), Michoacán, México; same as Matlaltzincas; pirinti means "interior (tribe)" in Matlaltz language. May be a family.

Piros (Tañoan F.), Chihuahua.

Popolucas, non-Nahuatl tribes of southern México.

Popolucas of Oaxaca, are Zapotecan.

Popolucas of Puebla, are Zoquean; the popolucas of southern Guatemala also speak Mixé (a Zoquean dialect).

Potlapiguas (Piman F.), Sonora, dialect of Pima.

Putum (Mayan F.), Chiapas, wrongly Punctunc; see Chol.

Sabaibos (Nahuatlan F.), Sinaloa, Durango; see Acaxees.

Sabaquis (Piman F.); same as Sobaipuris.

Saharipas (Piman F.), Sonora.

Seris (Yuman F.), Sonora; same as Ceris.

Serranos (Otomian F.), Tamaulipas, probably.

Sinaloas (Piman F.), Sinaloa; see Cahitas.

Sobaipuris (Piman F.), Sonora.

Sochimilcos (Nahuatlan F.), first of seven original Mexican cave-dwelling tribes.

Soltecos (Zapotecan F.), Oaxaca.

Sonoras (Piman F.), Sonora; Opatas.

Supis (Yuman F.), Chihuahua. The Hava sú-Pai, also of Arizona. These are Yuman.

Tañoan family, on the Rio Grande and its tributaries. (Bivell.)
Tantoyoc (Mayan F.), dialect of Huaxtec.
Tapanecos (Nahuatlan F.), original Mexican tribe.
Tapijulapanes (Zoquean F.), Tehuantepec.
Tarahumaras (Piman F.), Chihuahua.
Tarascos (Tarascan F.), Michoacán; also Guerrero, Guanajuato, Jalisco.
Tarelepa (Mayan F.), southern México.
Tatimoles (Totonacan F.), Veracruz.
Teacualitzistis (Nahuatlan F.), branch of Cora del Nayarit.
Teatas (Piman F.), Sonora; also Tehatas.
Tebacas (Nahuatlan F.), branch of Acaxees.
Tecojines (Zoquean F.), Jalisco, Tlapanecos.
Tecoripas (Piman F.), Sonora.
Tecos (Nahuatlan F.), Michoacán, for Cuitlatecos.
Tecualmes (Piman F. ?), Jalisco; see Coras.
Teguimas (Piman F.), Sonora; Opata, Teguis.
Tehua (Tañoan F.), near El Paso de Texas.
Tehuecos (Piman F.), Sinaloa, dial. of Cahita.
Tejanos, same as Coahuiltecan, Texanos.
Tektikilhatis (Totonacan F.), Veracruz.
Tenimes (Zoquean F.), Puebla; see Yopes.
Teotenancas, first Chichimecs in valley of México.
Tepanecos, third Nahuan tribe to arrive in México and one of three confederated tribes at time of conquest; capital, Tlatopan.
Tepeguana (Piman F.), Durango, Buschman's Aztec-Sonora.
Tepozcolula (Zapotecan F.), Oaxaca, dialect of Mixtec.
Tequis (Piman F.), Division of Opata.
Tequistlatecan family, in Oaxaca, see Chontal, Triquis.
Texanos (Coahuiltecan F.), Texas and N. E. Mex., family name.
Texones (Coahuiltecan F.), Tamaul, "raccoons," also Tejones, dialect of Pakawa (Gatschet), "tattooed," same as Coahuiltecan.
Tewan, see Tañoan family.
Tezcucos (Nahutlan F.), Mex., see Acolhuas, fourth Nahuatlan tribe to arrive in Anahuac.
Tlacopán, now Tacuba, suburb of the City of México.
Tlahuicos (Nahuatlan F.), one of seven original Mexican tribes.
Tlapanec (Zapotecan F.), Guerrero (dialect of Mixe, according to Brinton).
Tlascalans (Nahuatlan F.), sixth in order of seven orig. Mex. tribes.
Tlatluicans (Nahuatlan F.), fifth Nahuatlan tribe in Anahuac.
Toltecas, people of Tula, or Toltecs, Brinton, '94:129; Thomas, '99:235.
Tontos (Yuman F.), Sonora, now in Arizona.
Totonacos (Totonacan F.), Veracruz, first natives seen by Cortés.
Triquis (Zapotecan F.), according to Belmar; Tequistlatecan F., Brinton, Oax.
Tzentals (Mayan F.), Tobasco and Chiapas, many spellings.
Tzotzils (Mayan F.), Chiapas, dialect of Quelene.
Uchitas (Yuman F.), branch of Waikuru.
Varogios (Piman F.), Chih., br. of Taruhamara.
Vebetlateca (Mayan F.), Chiapas, the orthography of Don Palacio, xvi. century.
Xicalancas, preceded Toltecs in valley of México. Valentini thought they were Mayas.
Xicayan (Zapotecan F.), Guerrero and Puebla.
Xiximes (Nahuatlan F.), classed with Acaxees.
Yaquis (Nahuatlan F.), R. Yaqui, Sonora.
Yavapais (Yuman F.), eight bands, various spelling.
Yopes (Zoquean F.), Puebla, dialect of Mixe (Brinton).

Zapotecos (Zapotecan F.), Oaxaca, many tribes.
Zoquean family, Tabasco, Chiapas, Oaxaca.
Zuaques (Piman), Sinaloa, branch of Cahita.

These tribes and their ancestors developed their civilization as best they could under the skies and with the natural resources of the country.

In the matter of food, which is the most important consideration of all, the southern Mexicans were happily situated. Since the grade of a people's culture is measured by the amount and variety of artificiality in their daily lives, agriculture is a higher art than fishing or hunting or herding. How fortunate, then, were the Mexicans of old in that their attention was not distracted by the presence of large herds of buffalo or immense schools of fishes. There was in their dietary enough of meat and of fish, but they had the most economic grain in the world—maize—in some places yielding three crops a year. Besides, Mexican soil is congenial to all sorts of pulse, most nitrogenous of plant foods; to cacao; to the banana, most economic of fruits, and to a variety of vegetal productions not known in the temperate zone. There were no plows or agricultural machinery; but there was abundance of water supply and ample means of utilizing it through irrigation canals. Could the ancient régime be restored, an interesting picture would be afforded of premanganic or premechanical thrift. There were farmers in those days such as one might see in busy Japan fifty years ago or yet in many parts of China, where teeming populations are daily fed on ample though not varied fare, the product of human hands alone. The miller—generally the woman—ground the maize on a metate, or slab of lava, with a muller, rather than with a pestle, and cooked her cakes and bread on griddles and in the hot ashes, not differently from the ways of our own ancestors a few generations removed. It was the acme, the apotheosis, of the hand epoch, where there were fewer comforts, perhaps, but less misery. (Bancroft, 1875, ii, 242–562.) The serving of food was, like all other activities, conditioned on the social organization. Failing to recognize this, authors have read the most refined aristology into the rude but hearty feasting of the Mexican rulers in ante-Columbian times. For a gorgeous account of Montezuma's dinner the reader may consult Bancroft (1875, ii, 174–178), and as an antidote to this, Morgan (1881, 237–248), the truth doubtless lying somewhere between.

The next anxiety of a people after appeasing hunger is to clothe the body artificially against heat and cold, against rain and drought, and against damage from without. The ancient Mexicans wore sandals, which, because they had no rawhide for the soles, were woven or plaited ingeniously from vegetable fibers and fastened to the feet differently from the Egyptian type now worn. On the feet of gods and of great persons the sandals are highly decorated. The limbs were bare. Men wore the breech clout and women short kilts or petticoats. The upper part of the body was protected by means of a

shawl or robe fastened on the left shoulder, leaving the right hand free. Sleeved garments were not known. The head ordinarily was bare. In the wilder tribes men and women dressed scantily in garments made of skins. The more advanced tribes substituted clothing of bark cloth, like the Hawaiian tapa, of nequen fiber, and of cotton. Among the most cultured tribes barbaric splendor was the rule in dress. Every part of the body was decked with jewelry, feather work, and embroidery. Of the priests and persons in authority, as one may see from the codices and sculptures, it may be truly said that Solomon in all his glory was not arrayed like one of these. (Bancroft, 1875, 363–377.)

After clothing comes the habitation. Indeed, a house is a suit of clothing or costume for a family, a clan, a royal establishment, a religious sect. Morgan (1881) holds that the great stone structures of México now in ruins were communal houses, built on the models of those belonging to Indian tribes farther north. In this he is combated by those who look at them after studying the religious edifices of the Orient. No doubt these imposing remains are only a small fragment of what they stand for. As a stone arrowhead picked up on some field was once united to shaft and foreshaft and feathering, and was painted with significant markings, so these stone remains are only insignificant relics of their former selves. Wooden buildings with thatched roofs and with sides plaited into diaper patterns, painted screens, gardens, furniture, and household utensils are all gone. The ancient people lived doubtless very much as the native Mexicans do in our day. Making allowance for intrusions by way of Spain from North Africa and Egypt, and by way of Manila from the Orient, one may be helped greatly in restoring the former times by a study of modern buildings, not forgetting that the clan or gentile system of living prevailed in México as in all other parts of America.

The tools of the ancient stone workers were chiefly of stone. If there were any mason's tools of metal, they were inconsiderable. The Mexican lapidaries could chip, saw, bore, and polish obsidian, nephrite, and other gem stones, and inlay. They were also fond of and skillful in mosaic work, effected by carving masks and other objects in wood or shell, covering the surface with gum and overlaying with scraps of green and other colored stones. (Oppel, 1896, 4.) Excellent examples of this work have been dug from ancient pueblos in Arizona. (Fewkes, 1898, pl. 35.) The ancient Mexican stone masons used the pick, the bushing hammer, and the abrader, all of stone. They also employed wood for skids, levers, wedges, handles to stone tools, and for burning lime. To these primitive utensils must be added that manual dexterity which comes only through generations of practice and emulation. The tools of fellow-craftsmen were of the same primitive character, and yet with these they also produced astonishing results in wood, shell, gold, silver, and copper.

The Mexican engineer had no helpful beasts of burden, hence his countrymen became famous in the use of their backs, an art not yet passed away. He had the best of ropes, the inclined plane, the lever, the wedge, the parbuckle, and a primitive tackle without pulleys. In certain erections a false core was built up to sustain the masonry, and removed when all was finished. As for his line, plummet, foot rule, square, and numerical standards, nothing is known; only, if his metric system resembled his calendar, he used a decimal scale.

Among metrical appliances, time measures afford an excellent gauge of a people's progress—to mark definite portions of time, as with the sandglass; to tell the time of day, to note the proper day, furnish materials for the chronograph, the chronometer, and the chronologist.

The more savage tribes of México marked the length of an interval by the fading of leaves set up in the path and the width of the angle traversed by a shadow. Time of day was not registered artificially among the wilder tribes, but in the more cultured there were devices that operated on the principle of the dial. But the calendar of the Nahuatlan, Zapotecan, Totonacan, and Mayan families was quite up to that of the conquerors. The year consisted of three hundred and sixty-five days, in two parts; three hundred and sixty days, divided into eighteen months of twenty days each, and five intercalary days. Each day of the month had a proper name and a graphic symbol. The interpretation of these symbols has taxed the ingenuity of Mexicologists from the beginning. (Thomas, 1898; Seler, 1888.)

In this connection, for rating the culture status of the Mexicans must not be overlooked the harnessing of nature's forces for work. The Mexicans, originally, did not use the wind for power unless it may have been to waft the rudest kind of craft and to winnow their harvests. But water was dammed up for agriculture and for fish ponds, floating gardens were known, canals were dug for irrigation and transportation, and, most wonderful of all, in Yucatán were innumerable water caves. The soft, porous limestone, broken up by earthquakes, acted like a sieve for the surface waters, which dissolved for themselves subterranean channels. There are no surface springs, but the roofs of the underground streams, breaking in, formed cistern-like pits, with abundance of water at the bottom. These are approached by trails and ladders, and they have been improved artificially. (Holmes, 1895; Mercer, 1897; Thompson, 1897.)

The woodman was not in evidence to such degree as he became on the north Pacific coast, but all tribes knew the plant world well, and within the limits of the Republic there was a great variety of economic species for aliment, drink and medicines, for woods, for fiber. Timber was cut down with stone axes, split with wooden wedges, held together with wooden pegs and lashings. It was shaped roughly with adzes, and there was no lack of tools for creditable wood carving, as the architectural features of that substance bear witness, but drums

and furniture were also skillfully carved. The reed lent itself handily to a thousand clever arts.

The textile art was well advanced in México. Its coarsest products were the roofs of the dwellings, their ornamental walls and screens, and fences. Next came matting of reeds, yucca, and palm strips. By varying the plant, the dye, and the pattern, the most pleasing effects were brought about. Articles of dress and utensils of housekeeping without number were plaited from abundant and varied material. Basketry, through failure of tough roots and other material, was not equal to that farther north; but in place of it skillful fingers reveled in feather work, for which nature furnished with lavish hand not only abundant fiber for network, but plumage birds without stint for the gaudy covering.

The Mexican women could spin both with the fingers without mechanical help and by means of spindles, upon the manufacture of which much artistic skill was bestowed. They wove just as the Pima women of Arizona, their kindred, do even to this day, namely, sitting on the ground with warp almost horizontal, one end of it fastened to a stationary object, the other to a belt around their waists. By swaying their bodies they governed the tension. They could do plain weaving, in which the weft of different colors passes back and forth; they could manage diaper effects by counting warp threads at each excursion of the rude shuttle, or they could produce gobelin effects by weaving in the patterns separately. On the surface of these textiles lace work was effected also skillfully. It is an open question, however, whether the beautiful modern drawn work was of native development or imported from Manila in the sixteenth and seventeenth centuries. Tailoring, also, in the modern sense was unknown, garments being made out of the whole piece.

The question whether Mexican aboriginal culture is original or derived has been hotly debated by those who should have known that it is both. The problem of native culture is like those of the geologist and the chemist. In order to ascribe a phenomenon to certain layers or substances, these first exclude foreign intrusions. In the same way those arts which were developed on the soil of Mexico will be more clearly understood by the elimination of intrusions. From the crown of his head to the sole of his foot—literally, from headdress to sandal—the modern Mexican is Hispano-Egyptian through northern Africa, with an overlapping of the Orient through three hundred years of contact with the Philippines.

There was no potter's wheel; all vessels were being built up by the well-known processes of coiling, modeling, molding, and malleating or beating into shape with paddles. The art of covering with slip, painting, adding ornaments, and burning were well understood, but glazed pottery in ancient Mexico was not known. In the South the ware was far more refined in quality and ornament, that of the central

being overloaded with modeled work. Indeed, in the ware of to-day a school of potters, instead of modeling as the sculptor does, molds the parts of an intricate piece and then lutes them together. Among ceramic treasures are to be noted the musical instruments.

Gold, silver, copper, and perhaps tin were known to the cultured provinces. These metals are still found in the Republic abundantly, but to reconstruct the workshops of the goldsmith or the silversmith is no easy task. Astonishing effects may be produced in these metals, cold or in open fire, in the hands of clever workmen. Those who on a priori ground assert the knowledge of the blowpipe, the bellows, or the knowledge of fluxes do not remember how extremely handy many peoples are without them. Literature concerning the metallurgists, their shops, their tools, their processes, and their handiwork, is most meager. (Peñafiel, 1890.)

In commerce and transportation the apotheosis of human backs and limbs was to be seen in México of old, and in this day they compete successfully against beasts of burden and the iron horse. Mothers bore their children in their garments, the climate being too hot for the cradle board of the North. Passengers were carried on human backs in frames. Loads were packed and held in place both with headbands and breastbands. The commonest picture in some of the paintings is of the burden bearer, and the artist has not despised the carrying strap as a ground for pleasing designs. Runners were common, and relays, so that messages and perishable goods could be delivered quickly. The Mexicans were not skilled on the water. In their almost harborless and riverless country necessity for elaborate water craft did not exist. What little flotation was demanded rafts of reed and logs and dugout canoes supplied. In the more thriving States organized transportation, centers of distribution, and standards of value were established, but the nearest approach to money was in the shape of cacao beans, quills filled with gold dust, and small sheets of copper stamped with simple design. (Bancroft, 1875, 378–399.)

For the communication and record of ideas the tribes of México exhibit an interesting progression. The Sonoran branch of the Nahuatlan family were in this regard Indians pure and simple, with their spoken dialects, gesture speech, telephonic messages, painted robes, rock carvings, and symbolism. But the Southern families were far beyond that. They had not, forsooth, spelling books and printing presses, but they had gotten as far along as the rudest hieroglyphs of Egypt and Mesopotamia; certainly were as skillful as the Chinese. They had books much like those of eastern Asia, written on parchment or native paper in narrow pages and folded like a Japanese screen, and they engraved their thoughts on stone. The literature of the cultured Mexican tribes—that is, the artistic writing—has nearly all perished, but there was a professional class of scribes, and after the conquest they copied for their rulers many old documents and prepared

new ones, some of which remain unto this day. To the decipherment of these and of the intricate calendar system able scholarship has been devoted, and there is room here merely to refer to their researches. (Bancroft, 1875, ii, 508.) Seler says "The supposed differences between Aztec hieroglyphics and Maya manuscripts do not exist." (Proc. Roy. Geog. Soc. in Science, 1889, xiii, 295.)

Among these preserved picture writings are a number of sufficient importance to have absorbed the attention of eminent and enthusiastic scholars. They are called "codices," and they have been named from their discoverers, from their present locations, and from some historical fact connected with them. (Bancroft, 1875, ii, 529; 1876, v. 192.) The word codex, or codice, is somewhat confusing in this connection, being made to cover also old documents in the Spanish language as well as paintings relating solely to the conquest. Since the appearance of Lord Kingsborough's work and others mentioned by Bancroft the Mexican Geographic Society, Duc de Loubat, Thomas, and others have given to the world entire codices or parts in excellent form. Governments and institutions have liberally aided. Besides, the codices were mural inscriptions, calculiform characters on altars, monoliths, cartouches on ornaments, paintings on pottery, and glyphs on hard wood. (Starr.)

The list of efforts at their decipherment would transcend the limit of this publication. The names of most of them will be associated with the works of Brinton, Rau, Seler, Förstemann, Maudslay, Gunckel, Thomas, Saville, Goodman, etc.

Mexican and Maya codices, their locations and publishers.

Names.	Location.	Published in—
Berlin	Royal Library	Kingsborough, ii.
Baranda	Museo Nacional de México	Chavero, 1892.
Bodleian	Facsimile in Bodleian Library, Oxford.	Kingsborough, i, ii.
Bologna	Library of Scientific Institute	Kingsborough, ii; Duc de Loubat.
Borbonicus	Palais Bourbon, Paris	Duc de Loubat.
Borgia	College of the Propaganda, Rome.	Kingsborough, iii, 66; Duc de Loubat.
Boturini	Boturini Collection	Kingsborough, i.
Campos	San Juan de Cuauhtlantzinco, Puebla.	Starr, 1898.
Colombino	Museo Nacional de México	Antigüedades Mexicanas.
Cospianus		Duc de Loubat.
Cortesianus (Mayan)	Royal Museum, Madrid	Madrid.
Dehesa	Museo Nacional de México	Antigüedades Mexicanas.
Del Rios (3738)	Vatican Library	Duc de Loubat.
Dresden (Mayan)	Royal Library, Dresden	Kingsborough, iii; Förstemann, 1880.
Fejervary	Possession of M. F., Hungary	Kingsborough, iii.
Fernandez Leal	México	Peñafiel.
Lienzo de Tlaxcala	Museo Nacional de México	Antigüedades Mexicanas.
Mendoza	Bodleian Library, Oxford	Kingsborough, i, v, vi.
Peresianus or Mexicanus II (Mayan).	National Library, Paris	Archives Paleographiques, Paris, 1869, i.
Porfirio Diaz	Museo Nacional de México	Antigüedades Mexicanas.
Ramirez		
Telleriano Remensis	National Library, Paris	Kingsborough, i, v, vi; Duc de Loubat.
Relievo de Chiapas	Museo Nacional de México	Antigüedades Mexicanas.
Troano (Mayan)	Madrid	Brasseur, 1869; Thomas, 1882.
Vaticanus	Vatican Library, Rome	Kingsborough, ii, iii, v, vi; Duc de Loubat.
Vienna	Imperial Library	Kingsborough, ii.

The social organization of the aboriginals in México is one of the most excellent fields of research on account of the perspective which it presents. Here, in this limited area, which one may traverse in a summer vacation, are to be seen every grade and variety of the gentile system. On one extreme is the well-known mother rule, where descent is in the female line and there is little of private property or privilege; on the other is the picture of a great military confederacy of tribes, wherein father-right prevailed, where officers were elective, and a council of delegates from each tribe was charged with all affairs of state. Into this truly American social order it was easy for the early Spanish authors to read their own system and to use such terms as king, prince, general, and so on, but to the careful student the organization and functioning of society are explicable through a wider study of various peoples on the Western Hemisphere. Besides, there were, as has been pointed out, several linguistic families in México, who were as wide apart as Aryans and Magyars in Austria-Hungary; but even these had their agreements and treaties according to the plan of democracies. (Bandelier, 1880, with rich addition of footnotes.) Confirmatory of the thoroughly American gentile system of government and social order in México are the facts relating to the holding of real estate. It is not necessary to appeal to the tribes north of the Tropic of Cancer; in the more highly cultured tribes, as Bandelier shows with great erudition (1878), no man owned any real estate, no office owned land, all government land was independent of the rulers, conquest was never followed by partition of land, the notion of ownership in fee, of sale, barter, conveyance, or alienation was undreamed of.

The Southern Confederacies had not literally beaten their swords into plowshares, but they had converted the hunting implements, weapons, and devices, with many improvements, into the apparatus of war.

The organization of the army was not different essentially from that of their civil government. As in the Old World so in the New, there were storm centers where clouds of war met and spent their fury. The valley of México was one of these; hence the Nahuatlan tribes attained the highest point of military discipline of the New World. But their weapons were only bows and arrows, darts, throwing sticks (atlatl), javelins, and spears, for piercing; slings and clubs for striking; and the most murderous club, lined on either side with spalls of volcanic glass, for slashing. For defense they had shields, cotton armor, and wooden helmets, like those of the Thlinkit warriors in recent times. As is customary among the northern Indians, the Mexican soldiers decked their military equipments with gorgeous featherwork.

The organization of the army, the tactics, the strategy, the military engineering, the fortified places of the more civilized tribes, doubt-

less were of a higher order than the guerilla methods of the United States tribes of two hundred years ago. On the other hand, they err who would read into these the vocabulary of European war methods of the times. Bandelier says (1877, 161): "The Mexicans were not subject to a despotical power, but organized after the principles of a barbarous but free military democracy."

In the comparative sense, religion consists in what men think of a spirit world and what they do in consequence; the former is their creed, the latter their cult or worship. Creed has to do chiefly with the personnel and physiography of the spirit world, and it will be noted that in some measure that world is the reflection of this. Its supernal beings are organized as a society, and their motives as well as their conduct have reference to human beings.

In cult, human society is organized, buildings are erected, costumes are worn, food is eaten, days are observed, and certain austerities practiced, all with reference to beings unseen to mortal eyes, but cognizable by a special sense. The most refined art and music and the best of everything go to the gods.

On this definition the Mexican religion had its creed and its cult, its heaven and its pantheon, as well as its temples, altars, and priesthood; its mythology and worship.

The northern or pueblo tribes of México must be studied in the light of the pueblo tribes of Arizona, worked out by members of the Bureau of American Ethnology. Its wild tribes lived near to their unseen world like their brethren of the north. We are here concerned with the religion of the southern families. Bancroft (1875, iii) devotes five hundred pages to the religion of the Pacific coast tribes; the larger part is given to the topic here considered. On every monument, sculptured slab, decorated wall or vase, the spirit world is manifested. It is a Mexican Pantheon. The warrior god is supreme; the priests are ministers in a church militant. Sacrifice, incense, pomp in worship, revolting rites, prolonged rituals, obtrude themselves and override industry and art.

The æsthetic side of Mexican life in aboriginal times covered a wide area, but nowhere reached an enlightened stage. There were public fêtes and games, but there was no drama per se. There were social rules or fine art of behavior—in the open, in the family, at the feast, every one had a place; but behavior where there was so little furniture scarcely rose to etiquette. There was fine art of dress and its accessories, but not far above that of the Mandan Indians. Vocal music was singing in unison, and there are those who say that the Mexicans had a scale of notes which can be reproduced on an organ with fixed pipes, but this is denied. The musical instruments of the Mexicans were flageolets and flutes of wood, bone, and pottery. Whistles of grotesque shapes, reed instruments of unique form, drums of wood,

(teponaztli), and with heads of membrane (huehuetl), rattles (ajacaxtli), and bells (yotl), but the existence of stringed instruments is doubtful. In some of the sculptures students see representations of this class, but others as clearly witness the notched rattle. (Seler, 1898.)

As for the graphic and glyphic art, sculpture, and architecture, the student can not fail to note everywhere the sense of the beautiful struggling to help symbolism and to disengage itself from its more childish forms. Unity, proportion, symmetry are all there, and some of the world's standard forms have been reached. One well qualified to judge has said: "Most of the motives employed in embellishment have their origin in religion; their use was first significant and second æsthetic. * * * All the sculptor's art is crude as compared with civilized art, but it is virile and full of promise of higher achievement. * * * There is lack of perspective and a mixing up of sizes, and the general style of presentation is suggestive of that of the ancient Egyptians." (Holmes, 1895, 52.)

No other part of the Western Hemisphere has such abundance and variety of attractions for the archæologist as the territory of the Republic of México. In order to comprehend this area one must study the pyramidal mounds of the Mississippi Valley; the immense log buildings, sculptures, and totem posts of the north Pacific coast; the massive walls and composite arrangement of the pueblos; the infinite variety of geometric patterns and designs on basketry; not neglecting, finally, the full-costumed Crow warrior of Montana, wearing his decorated breech clout and moccasins, and gorgeous headdress of eagle plumes, which spans his head like a huge rainbow and descends to the ground in a long train. It is not necessary to maintain that the sculptors of southern México were the immediate blood kindred and colinguists of all these widely scattered tribes. Only they use the same alphabet and art motives. The Mexicans were mound builders, totem carvers, pueblo designers, fretwork weavers, and costumers in stone, the material which, more than all others combined, evoked the virile qualities of early races.

Regarding the antiquities of México, the present territory may be further subdivided into (1) the Mayan province, east from Tehuantepec, including Yucatán, belonging, perhaps, to Central America; (2) the Nahuan-Zapotecan province, reaching from Quemada, in Zacatecas, southward to Tehuantepec, revealing an advanced and somewhat mixed culture; (3) the Pueblo province, with its compound, storied houses and smooth, coiled pottery, which is not bounded northward by the boundary line, but reaches far into the United States; (4) the wild province, home of cliff dwellers and devoid of architecture and pottery. The antiquities of México do not end with the boundaries of the Republic. At the north, the Casas Grandes, in western Chihuahua, on Casas Grandes River, is an immense adobe

CHAPULTEPEC PARK, CITY OF MÉXICO.

structure, allying itself with the present and ancient pueblos of Arizona and New México. Moreover, there were throughout the same region and southward natural and artificial cave dwellings. (Lumholtz, 1898.) At the southeast, Mexico passes insensibly from the Mayan culture of Yucatán and Chiapas into the antiquities of Guatemala.

The mural remains of the Republic are comprised within narrow limits, extending from the sixteenth to the twenty-second parallel, from Soconusco to Quemada. Yet in this contracted area are to be found more structures of stone than in all America besides.

Of this architecture there are held to have been several schools. Indeed, this should be looked for, since, in addition to the natural gates or opportunities opened by the several environments, there were on this territory, in rivalry, several linguistic families. In Yucatán and Tabasco was the Mayan family, with an outlying branch in northern Veracruz. Next to them, westward, were the Zapotecan and the Zoquean family, and in a circle about the City of México were Nahuatlan, Totonacan, Otomian, and Tarascan tribes. (Brinton, 1891, 128–162.)

Every variety of material enters into the permanent building, to wit, the plain dirt heap, the modeled dirt heap or mass; even mountains were remodeled; sun-dried clay, either as bricks or in larger masses; stone and clay or other bonding material, mixed in rubble; used in vast quantities; walls faced with uncut stone, which in some localities was supplied by nature in good form; cut stone in walls laid up without adhesive material; stone walls laid in clay, mortar, and cement; carved architectural features; relief carvings; sculptures in the round. As for the adhesive substances, besides clay and other natural cements, lime mortar has been mentioned and the possibility of its existence denied, but caustic lime was not beyond the Mexican builders, since burnt shells occur universally as a degraissant in American pottery. There was no lack of durable wood to serve as lintels to doors and to support ceilings. This material, doubtless, was used for doors, partitions, screens, and interior decorations, and was cut, hewn, and carved with great skill. (Holmes, 1895, 25.)

The architecture was oversolid, and consisted of rough masses of dirt and rude masonry, faced with smoothed cut stone. Layard encountered just this combination in excavating Nineveh. A recent investigator calls attention to the lack of the best elements of construction. (Holmes, 1895, 27–30.) The arch and the dome were unknown. Long pentagonal openings, with horizontal bases, called false arches, were the best that the architects could do. On this overmassive structure there was an equally barbaric excess of decoration—false fronts, roof combs, cornices, mosaic and stucco work. One imposing feature is the terrace and stairway presented in endless variety, affording not only access to superior structures, but sitting room or grand stand for the laity.

The two central features about which all plazas, paved ways, bank-

of earth, and walls or parapets cluster are the pyramid and the squared structure, the mound and the log house made in stone. Of the former, the function is largely outside; of the latter, owing to the solidity of the walls, it is only partly inside. The pyramid may have additions interior and inferior, but its attractive parts are exterior and superior. The built-up and squared structure lends all its parts, indeed, to the architect, the modeler, and the sculptor, but it also was to be gazed at from without. The pyramid was divided into stories by placing a series of truncated pyramids one above another and by cutting out terraces from a single form.

In the most important remains there is such evident relationship between structure and structure as to prove that one purpose runs through the whole. And while some great buildings give evidence of accretions, others, says Holmes (1895, 23)—for example, the palace at Uxmal and the castillo at Chichen—show that when the building began the whole plan, to the minutest detail, had been thought out. Very few of the buildings are accurately oriented, as that term is commonly understood. Certainly the modern style of laying off cities in rectangles was as little known in México as among the European contemporaries.

Their purposes are easily harmonized with the environment, the kinship system, and the culture system of the peoples. Some of them are forts, to defend whatever was in them. Some of them were religious, with their court of the women, court of the laity, and the other societies, court of the society and pathway of the priests to a kind of shrine or holy of holies. If only on some bright, sunny day the pageant could return, what a picturesque sight one of those temple structures would afford, having every terrace and stairway filled with gay costumes, to which gold and silver and precious stones, the efflorescence of the fields, and the plumage of birds lent their willing service.

For the first time the sites of archæological remains in México are here codified in the alphabetic order of States. Such a provisional list will serve future investigators as a starting point for additions and corrections. A distinction should be made between relics and remains. The former are movable and personal, and can not always be relied on for locations, but remains are stationary and are useful on the spot. They should be guarded with the greatest care both by the Government and by public spirit against destruction or removal.

ANCIENT REMAINS IN MÉXICO.

AGUASCALIENTES: No remains reported.

BAJA CALIFORNIA: Rock paintings and inscriptions.

CAMPECHE: Paved roads, or calzadas; terra-cotta idols, etc.

CHIAPAS:

Palenque, ancient city of vast extent, Charnay, 1887; Holmes, 1895; Maudslay, 1897.

Lorillard City, ruins resembling Palenque, Charnay, 1887.

Ocozingo, groups of ruins, sculptures, hieroglyphs.

CHIHUAHUA: *Rio des Casas*, adobe pueblos, Casas Grandes, Thomas, 1899.

COAHUILA:

San Lorenzo, rock paintings, mummies, relics.

San Martin, ruins and pottery.

COLIMA: No remains reported.

DURANGO:

Bolsón, rock paintings and carvings, mummies.

La Breña, caves yielding relics; between Suchil Valley and Chalchihuites, Chichimec remains.

GUANAJUATO: Only cave dwellings and relics.

GUERRERO: Foundations, remains of settlements.

Una, ruins and burial places.

Tlapa, tombs called Teteles.

HIDALGO: *Tula*, pyramid, sculptures, idols, relics, Charnay, 1887; Peñafiel, 1890.

JALISCO: Artificialized hills.

L. Chapala, vestiges of ancient settlements and pottery, Starr, 1897.

MÉXICO:

Actopan, pottery relics.

Ahuehuepa, statue bearing hieroglyphics.

L. Chalco, causeways across the lake; traces of ancient city on Xico Island; sculptures on Misquique Island; sculptures at Xochimilco; carved cylindrical stones at Tlahuac; ancient town of Culhuacan; idols, heads, fallen pyramids at Tlalmanalco.

Chapultepec, carvings on cliffs.

Malinalco, ancient wood carvings.

México City, or *Tenochtitlan*. In the city all temples, etc., have been razed; calendar stone, sacrificial stone, statue of Coatlicue, sculptures at Tlatelulco; ruins of fortified hill at Tenango, Peñafiel, 1890; Holmes, 1897.

Mecamecan, rock pyramid, carved.

Navajas, obsidian mines.

Ozumba, carved blocks of stone.

Remedios, terraced, stone-faced hill.

Tacuba, ruins, pyramids of sun-dried bricks.

Tezcuco, causeway at Chapingo; idols, pottery, relics at Contador; terraced hill and aqueduct at Tetzcutzinco (Reyes, 1888); stone wall in mortar at Huejutla; ruins of ancient city at Teotihuacan, immense pyramids and paved way, Charnay, 1887; Holmes, 1897; Peñafiel, 1899.

Otumba, ruins at Tulacingo and San Miguel.

Xonacatepec, stone masks, carved circular stone.

Yahualua, tombs with stone images, northward.

Tyupilco, buildings of thin blocks of stone.

Zacualpan, stone masks and relics.

MICHOACÁN: Opals and other gems, and remains at Jiquilpán; small mounds at Irimbo; rock carvings on Aniche Island; ancient capital of Tarascos at Zintzuntzan, L. Patzcuaro, Leon, 1888–1890.

MORELOS:

Xochicalco, terraced hill, paved roads, galleries, hill covered with masonry, summit platform, fine sculptures, Peñafiel, 1890, ch. viii.

Cuernavaca, figures carved on bowlders; temple pyramid.

Tepoztlan, Saville, 1896; Seler, 1898.

NUEVA LEON: No antiquities reported.

OAJACA:

Tehuantepec, pyramids with stairs, fortresses, ruins, underground tombs, pottery Estrada, 1892; ruins of Quiengola, 1896.

OAJACA—Continued.

Magdalena, statue of Zapotec prophet, Wixepecocha.
Petapa, caves with painted walls.
Loallaga, mound and hieroglyphics.
Chihuittan, ancient bridge.
Guatulco, ruins of ancient city.
Tlacolula, mound of earth.
Quiyechapa, ruined fortress.
Etla, underground tombs, images.
Peñoles, skull preserved by lime; pyramid at Tepantepec, tombs at Teotitlan.
Quilapan, mounds everywhere.
Monte Albán, fortified holy place, subterranean chambers, pyramid, hieroglyphics, etc., Holmes, 1897.
Zachila, mounds, burnt bricks, walls, statues; Tombs of Xoxo (Saville, 1899).
Mitla, finest ruin in the State and one of the grandest in Mexico, Charnay, 1867; Peñafiel, 1890; Holmes, 1897.
Quietepec, hill covered with ruins, platforms, terrace walls, pyramid; at Tuxtepec, mound 63 feet high.
Hualmapam, sculptures in low relief, pottery, gold objects.
Yanghiltan, sculptured human figures.

PUEBLA:

Tehuacan, ruins of stone structures.
Chila, pyramid of hewn stone, cement covering, stairway.
Tepiaca, sculptured head and slabs.
Tepixe, storied pyramid, hewn stone, lime mortar.
San Cristóbal, storied pyramid, stairway, graded way.
Cholula, storied pyramid, 1,440 feet square, 200 feet high.
Chalchicomula, storied pyramid with stairs.
Quatulhquelchula, relief; ruins at San Pablo.

QUERÉTARO:

Querétaro City, fortified hills, pyramids, works.
Pueblita, stone walls, sculptures, mounds.
Ranas, forts, pyramids with stairs, burial mounds.
Toluquilla, ancient city and fort. Reyes, 1881.
San Juan, mound containing idols.

SAN LUIS POTOSÍ: No remains reported.

SINALOA: Vestiges of ruins at Mazatlan.

SONORA: Ruins at Babiacori; grottos at Sohuaripa.

TAMAULIPAS:

Encarnación, stone idol.
Cramelote Creek, mounds, dressed stone, images, pottery.
Salt Lake, pyramidal mounds, stone faced, with steps.
Zopila, mounds faced with stone, carved stones, pottery.
Tampico, idols of basalt, carvings, pottery.

TLAXCALA:

Malinche, walls, pyramids, stone images.
San Pablo, kneeling figure in stone
Natividad, terraced hill, ruins, standing stones, relics.
Cacaxtlan, fort, ditches, underground ways.
Tlaxcala, sculptures, pottery, stone bridges, brick parapets, obelisk at Pueblo de los Reyes, wall on frontier of State.
Tizatlan, ruins, called Xicotencatl.

VERACRUZ:

Veracruz City, ports, pyramids, foundations, graves, west of the city, in abundance.

VERACRUZ—Continued.

Sacrificios I, temple, sepulcher, relics.
Cazapa, ruined city, colossal head.
Orizaba, sculptured yokes, carvings, grotto.
Jalapa, serpent carved in rock.
Puente Nacional, storied pyramid, with stairs.
Córdoba, line of forts.
Cautla, terraced pyramid faced with hewn stone, forts.
Huatusco, pyramid with broad stairway, forts.
Mirador, baths and rock inscriptions.
Zacuapán, pyramid, plaza, terraced walls.
Tlacotepec, forts and aqueduct.
Consoquitla, fort, plastered pyramids, idols, relics.
Calcahualco, forts, pyramids, columns.
Misantla, pyramids of hewn stone pavements, ruins.
Jalancingo, walls of hewn stone, subterranean shrines.
Papantla, terraced storied pyramid; other pyramids at Mapilca ranch.
Tusapan, pyramid with stairs, building on top.
Metlaltoyuca, pyramids of hewn stone, pavements.
Panuco, statues and relics.
San Nicolas, oven-like chamber, ruins.

YUCATÁN:

Uxmal, immense Maya ruins; also pyramids, sculptures, and statues near Uxmal, at Senuisacal, Muna, Sacbé, Nohcacab, Xcoch, Nohpat. Charnay, 1887; Holmes, 1895.
Kabah, group of 16 structures, storied buildings, sculptures, arches; southeast from Kabah, ruins at Sanacte, Xampon, Chack, Sabacehé.
Zayi and Labná, Charnay, 1887; Thompson, 1897b.
Kewick, Xkichmook, and Xul, ruined cities and paintings. Thompson, 1898.
Tekax, ruins at Sacacal, Ticum, Santa Maria, and Chacchob.
Loltun, caves, underground water supply. Mercer, 1897; Thompson, 1897a.
Akil and Mani, remains of cities.
Chichen Itza, ruined city and forts, sculptures; near-by ruins at Tinum, Espita, Xocen, Sitax, Coba. Charnay, 1887; Holmes, 1895; Mandslay, 1897.
Ticul, pyramidal mounds, ruins. Charnay, 1887.
Mayapan, mounds, sculptures, remains of ancient Maya capital.
Mérida, on ruins of ancient city of Tahoo.
Ake, ruins of rude architecture. Charnay, 1887.
Izamal, pyramids, sculptures. Charnay, 1887; Holmes, 1895.
Bolonchén wells (cenotes), sculptures.
Labphak, grand Maya ruin.
Iturbide, mound of ruins, ancient town, remains near Noyaxche, Macoba, Mankeesh, Jalal, Yakatzib, Becanchen.
Tuloom, walled town. Holmes, 1895.
Cozumel, buildings and cisterns. Holmes, 1895. Ruins also at Point Nisuc, mouth of Petampich River, Kancune Island, Mujeres Island.
Cayo Ratones, Cape Catoche, Yalahao, Emal, Monte Cuyo, Rio Lagartos, Port Silan.
Maxcanú, mounds with galleries, ruins, señotes (underground water supplies). Owing to the geological formation there are no water courses on the surface.

ZACATECAS:

Quemada. Immense ruins on mesa, roads, mounds, dressed stone, terraces, but no inscriptions or architectural decorations. At Quemada, coming southward, begin those monuments in stone that mark the virile culture of southern Mexico as against the feminal arts in clay farther north.

In order to make this brief summary valuable as a guide to students in Mexican archæology and ethnology, a list of modern works is appended[a] which have been printed since H. H. Bancroft's Native Races of the Pacific States (1874–75) and Justin Winsor's Narrative and Critical History of America (1889) appeared. For earlier authorities the reader can not overlook Bandelier's footnotes and that wonderful result of patience and accuracy, Sabin's catalogue of works relating to America. In the text of this article the titles here given are referred to by dates, following the plan of Dr. C. S. Minot.

[a] See Chapter XX, page 423, for list.

CHAPTER IV.

GOVERNMENT AND CONSTITUTIONAL ORGANIZATION—CITIZENSHIP—RIGHTS OF FOREIGNERS—GUARANTEES—ARMY AND NAVY.

Government.—The Constitution now in force in México, originally promulgated February 5, 1857, and subsequently amended, declares that the Mexican Republic is established under the representative, democratic, and federal form of government, composed of States free and sovereign in everything relating to their internal administration, but united in one single federation in accordance with the principles set forth in said Constitution. The Supreme Government is divided into three coordinate branches, viz, Legislative, Executive, and Judicial.

Legislative power.—The legislative power of the nation is vested in a general Congress, consisting of two Chambers, the Deputies and the Senate. The Chamber of Deputies is composed of representatives of the nation elected every two years by the Mexican citizens and in the proportion of one Deputy for every 40,000 inhabitants, or fraction over 20,000, the term of service being two years, an alternate number being elected for each Deputy.

The requisite qualifications to be a Deputy are: To be a Mexican citizen in the full exercise of his rights, 25 years of age, a resident of the State or Territory where chosen, and not to belong to the ecclesiastical state. In 1897 there were 227 members in the Chamber of Deputies.

The Senate consists of two Senators for each State and the Federal District, chosen in the same manner as Deputies, and subject to the same limitations as to citizenship, residence, and civil status, but the age limit is 30 years, and the term of service four, half the Senate being renewed every two years.

Federal officeholders receiving a salary are ineligible for election to either Chamber.

Congress.—The Congress has two ordinary sessions annually—the first, which may be extended thirty days, beginning on September 16 and ending on December 15, and the second may be prorogued for fifteen days, convening on the 1st of April and adjourning on the last day of May.

During the recesses of Congress a permanent committee, with limited legislative functions, sits, composed of 29 members, 15 being

Deputies and 14 Senators, appointed by the respective Chambers on the eve of adjournment. The duties of this committee are: To give assent to the calling out of the National Guard for use beyond the limits of their respective States and Territories; to call, on their own motion or at the instance of the President, extra sessions of either or both Chambers; to confirm certain Executive nominations; to administer the oath to the President and Justices of the Supreme Court; to report on all matters unacted on by the previous Congress, so that the next may have business to take up immediately upon convening.

Executive power.—The Executive power is lodged in a single individual, known as the "President of the United Mexican States."

The President is elected indirectly by electors chosen by the people. His term of office is four years, commencing on the 1st day of December after election. By an amendment to the Constitution, under date of December 20, 1890, he may be reelected indefinitely. Temporary vacancies in the Presidency are filled by the person serving as Secretary of State, while in case of death or permanent disability a provisional President is elected by Congress, who discharges the office until one is elected by the people.

Following are the qualifications requisite for President:

(1) To be a native-born Mexican citizen, in the full exercise of his rights.

(2) To be 35 years of age.

(3) To not belong to any ecclesiastical order.

(4) To be a resident of the country at the time of election.

Cabinet.—The President is assisted in the discharge of his duties by a Cabinet, consisting of seven Secretaries, heads of the Departments of Foreign Relations; Finance and Public Credit; Communications and Public Works; Promotion, Colonization, and Industry; Interior; Justice and Public Instruction; War and the Navy.

Cabinet officers must be native-born Mexican citizens, and at least 25 years of age. All Executive regulations, decrees, and orders must be countersigned by the head of the department to which they refer, otherwise they are inoperative.

Salaries.—The salary of the President is $50,000 per annum, and of the Cabinet officers $15,000.

Judicial power.—The judicial power is vested in the Supreme Court of Justice and the district and circuit courts. There are three circuit and thirty-two district courts. The Supreme Court of Justice is composed of eleven "ministros," or justices, four alternate justices, an Attorney-General, and a public prosecutor. Their term of office is six years, and they are elected by the people indirectly, in the same manner as Deputies and Senators. The qualifications required are to be learned in the law, in the judgment of the electors; to be at least 36 years of age, and to be Mexican citizens in the full exercise of their rights.

Federal courts have jurisdiction—

(1) In all cases arising from the enforcement and application of Federal laws, save when such application affects only private interests, in which case the ordinary courts of the States, Federal District, and Territories shall be competent to assume jurisdiction.

(2) In admiralty cases.

(3) In cases to which the Federation is a party.

(4) In cases arising between two or more States.

(5) In cases arising between a State and one or more citizens of another, or between two or more States.

(6) In civil or criminal cases arising from treaties concluded with foreign powers.

(7) In cases affecting diplomatic and consular agents.

The Supreme Court of Justice has original jurisdiction in all cases arising between two States, and in those wherein the Union is a party. This court must also settle all controversies arising among the Federal courts, between these and the State Courts, or between the courts of two States. The Supreme Court is also the court of last resort in all other cases here mentioned.

The jurisdiction of the Federal courts extends also to all cases growing out of (1) laws or acts of any authority infringing on individual rights; (2) laws or acts of the Federal authority violating or limiting the sovereignty of the States; (3) laws or acts of the latter encroaching on the Federal authority.

The salary of Supreme Court justices is $5,000 and of circuit and district judges $4,000 a year.

State's government.—As provided by the Federal Constitution, the interior government of the States is republican, representative, and popular, and is divided into the same branches as the General Government.

1. The legislative power in the large majority of the States is vested in a single representative body called a congress, the members of which are called deputies, and are in most States elected indirectly by the people, serving two years.

2. The executive power is lodged in a governor, elected, almost without exception, by indirect vote of the people, and serving for four years.

3. The judicial power in the greater number of States resides in a supreme court of justice and inferior courts and judges.

The States are divided politically, as a rule, into districts governed by a *jefe político*, or a prefect. The minor divisions are municipalities, the local authority being an *ayuntamiento*, corresponding to the town council in the United States of America. Each State is bound to deliver, without delay, criminals from other States to the authority demanding them.

Limitations.—By the Federal Constitution the States are prohibited from—

(1) Concluding any alliance, treaty, or league with another State or foreign powers, except the league which may be formed between frontier States for offensive or defensive warfare against savages.

(2) Issuing letters of marque or reprisal.

(3) Coining money, issuing paper money, stamps, or stamped paper.

(4) Obstructing the transit of persons or goods crossing its territory.

(5) Prohibiting or molesting, either directly or indirectly, the entrance or exit to or from its territory of national or foreign merchandise.

(6) Obstructing the circulation or consumption of national or foreign goods by means of imports or taxes that may be exacted through local custom-houses, by requiring the inspector of registration of packages, or by requiring the documentation to accompany the merchandise.

(7) Decreeing or maintaining in force laws or fiscal decrees which may cause differences of taxes or requisites, by reason of the source of national or foreign merchandise, whether these differences be established in regard to a like production in that locality or on account of like production from different sources.

Nor can they, without the consent of the Congress of the Union—

(1) Establish tonnage or any other port dues, nor impose burdens or duties upon imports or exports.

(2) Maintain at any time a standing army or ships of war.

(3) Make war by themselves on any foreign power, save in cases of invasion or of danger so imminent as to admit of no delay, in which cases they must immediately report to the President of the Republic.

Powers of the Federation.—It is the exclusive faculty of the federation to obstruct merchandise, imported or exported, or which passes in transit through the national territory, likewise to regulate at all times, and even to prohibit for reasons of policy and security, the circulation within the Republic of all merchandise from whatever source; but the said federation can not establish or decree in the District or Federal Territories the taxes and laws expressed as regard the States. The Federal District and the Territories are, as in the United States of America, under the control and jurisdiction of the Federal Government, although the local authorities are elected by the people, as are Deputies and Senators to the National Congress. The population necessary to entitle a Territory to statehood is 120,000 inhabitants at least.

CONSTITUTION.

The Mexican Constitution recognizes that the rights of man are the foundation and the end of social institutions, and consequently everyone is bound to respect and give support to the guarantees granted by

it; that the national sovereignty is essentially and originally vested in the people; that all public authority emanates from the people and has been instituted for the good of the people; that the people have, at any time, the inalienable right of altering or modifying the form of government; and exercises its sovereignty through the national and State governments as prescribed by the Federal Constitution and the constitutions of the several States, the latter constitutions in no case whatever being allowed to obstruct the provisions of the Federal compact.

Constitutional rights.—All persons born within the territory of the Republic are free, and slaves become free, and are under the protection of the law upon entering the country. Education is free, except as regards the exercise of certain professions regulated by the laws. Freedom to exercise the liberal professions, freedom of thought and of the press, are guaranteed, the latter with the restrictions imposed by the rights of others, peace and public morality. The rights of petition and of peaceful organization are recognized. The right to own and carry arms for lawful self-defense and protection is also recognized, subject, however, to the restrictions of the law; also the right to freely enter, leave, and travel over the Republic and to change one's residence, without passport or any similar document, subject, however, to the judicial or administrative authority in cases of criminal or civil responsibility.

The inviolability of correspondence circulating through the mails is recognized, the infractors being severely punished. Private property can not be occupied without the consent of its owner, except in cases of need for public service, an indemnification having been previously paid, as prescribed by law. The quartering of soldiers, in time of peace, upon the property of individuals is forbidden, as well as in time of war, save under the regulations established by law.

Prohibitions.—Titles of nobility, hereditary honors, and prerogatives are not recognized, nor is the authority or judgment of special laws or privileged courts. *Ex post facto* laws and the conclusion of treaties for the extradition of political offenders, also such treaties or agreements as shall in any manner alter the rights and guarantees accorded to men and citizens by the Constitution are expressly prohibited, as well as the right of search without a warrant issued by competent authority.

Imprisonment for debt of a purely civil nature is abolished. Violent measures in the support of individual rights are prohibited, as the administration of justice by the courts is done gratuitously. Arrest, except for offenses meriting corporal punishment, is prohibited, as is also detention without trial for a longer period than three days, unless justified as prescribed by law. The authorities are empowered to punish severely any ill treatment inflicted upon prisoners, either at the

time of arrest or while imprisoned, as well as any other abuses. The rights of the accused are guaranteed, the application of penalties other than those purely correctional being limited exclusively to the judicial authority. Mutilation, branding, whipping, clubbing, torture, excessive fines, confiscation of property, and any other form of infamous punishment is prohibited. The death penalty is limited to the crimes of high treason during a foreign war, highway robbery, arson, parricide, willful murder, high military crimes, and piracy, as provided by law.

No civil or ecclesiastical corporations of any description are permitted to acquire or manage landed estates, with the exception of the buildings directly devoted to the service or objects of the institution, nor are religious institutions permitted to acquire landed estates or the capital invested thereon, except as prescribed by law.

Monopolies of all descriptions, under pretext of industrial protection, are prohibited, excepting the Government monopolies of coinage and the postal service, and the limited privileges granted by law to patentees of any useful invention.

Suspension of the constitutional guarantees.—The President, with the concurrence of his Cabinet and the approval of Congress, or, during its recess, the Congressional Permanent Committee, may suspend all constitutional guarantees in case of invasion, grave internal disorder, or serious disturbance endangering the State, but only for a limited period and by means of general orders; such suspension, however, according to the law, not to affect individuals.

CITIZENSHIP.

Section II of the Constitution declares that Mexican citizens are (1) all persons born in the country, or abroad, of Mexican parents; (2) all foreigners naturalized under the laws of the federation; (3) all foreigners acquiring real estate in the Republic or begetting children by Mexican mothers, unless distinct claim of citizenship elsewhere is avowed in due legal form. It is the duty of every Mexican to defend the independence, territory, honor, rights, and interests of the country, and to contribute to the general expenses, both of the federation and of the State where he resides, as prescribed by law.

Rights of citizens.—Citizens of the Republic are those who, besides being Mexicans, are over 18 years of age, if married, or 21, if unmarried, and possess honest means of livelihood. Their prerogatives are, the right to vote in the popular elections; to be elected by vote to all the charges, posts, and commissions for which they are legally qualified; to organize for the purpose of treating of the political affairs of the country; to enter either the general army or the national guard, in order to defend the Republic and its institutions, and to exercise the right of petition in all matters.

Duties.—The duties of the Mexican citizen are, to be inscribed in the register of his municipality, stating the amount of property he holds, or the trade, profession, or industry he is engaged in; to enlist in the national guard; to vote in the elections of his district; and to faithfully discharge the duties pertaining to any post to which he may be elected in the Federation.

Forfeiture of citizenship.—Citizenship is forfeited, (1) through naturalization in a foreign country; (2) by serving, in an official capacity, the government of another country, or by accepting from a foreign government decorations, titles, or charges—other than literary, scientific, or humanitarian—without previous consent of the Federal Congress. The law determines the cases and form entailing the loss or suspension of the rights of citizenship and the manner of rehabilitation.

ALIENS.

Under date of May 28, 1886, a law was passed by the Mexican Government governing aliens and their naturalization, which is, in substance, as follows:

Rights of aliens.—Aliens enjoy in the Republic the civil rights belonging to Mexicans and the guarantees granted by section 1 of title 1 of the Constitution, without prejudice to the Government's right to expel a pernicious alien.

For the acquisition of waste or public lands, real estate, and ships, aliens are not required to reside in the Republic, but they are subject to the restrictions imposed by existing laws; in the understanding, nevertheless, that every lease of real estate to an alien for a period exceeding ten years shall be deemed a full conveyance.

The Federal law alone can modify or abridge the civil rights enjoyed by aliens, in consequence of the principles of international reciprocity, and in order that the aliens may thereby be subject in the Republic to the same disqualifications as the laws of their own country impose on Mexicans residing there; hence the provisions of the civil code and of the code of civil procedure of the Federal District on this subject have a federal character, and shall be obligatory throughout the whole Union.

Aliens may be domiciled in the Republic for all legal purposes without losing their nationality. The acquisition, change, or loss of domicile are governed by the laws of México.

When the suspension of individual guarantees is declared under the provisions of article 29 of the Constitution, aliens, as well as Mexicans, are subject to the provisions of the laws decreeing the suspension, without prejudice to the stipulations of treaties.

Limitations.—Aliens are bound to contribute to the public expenses in the manner prescribed by the laws, and to obey and respect the institutions, laws, and authority of the country, subjecting themselves

to the judgments and decisions of the courts, and having no right to have recourse to other measures than those which the law grants to Mexicans. They may appeal to the diplomatic channel only in the case of denial of justice or intentional delay in its administration, after exhausting in vain the ordinary means created by the laws, and in the manner prescribed by international law. Aliens can not enjoy any of the political rights of Mexican citizens. Aliens are exempt from military service. Domiciled aliens are bound, however, to perform police service when the security of property or the maintenance of order in the locality in which they are residing is involved.

Aliens taking part in the civil dissensions of the country may be expelled from its territory as pernicious aliens, and are subject to the laws of the Republic as to the offenses which they may commit against it, without prejudice to the regulations of their rights and obligations during a state of war, by international law and treaties.

Citizenship.—The laws ordering the registration of aliens are repealed. The Ministry of Foreign Relations alone can issue certificates of any given nationality in favor of the person requesting them. These certificates constitute legal presumption of foreign citizenship, but do not exclude proof to the contrary. The final proof of any given nationality is made before the competent courts, and by the means prescribed by the laws and treaties.

Aliens who have acquired real estate and who have had children born to them in México, or who have held any public office are bound to declare within six months after the promulgation of this law, if they have not done so previously, before the civil authorities of their place of residence, whether they wish to acquire Mexican citizenship or retain their own. In the former case they must immediately ask for their certificate of naturalization. If they fail to make the declaration in question they shall be considered Mexicans, except in those cases where there has been an official declaration to this end.

Colonists in México come under the provisions of this last article.

GENERAL PROVISIONS.

The following are among the general provisions of the Constitution: In time of peace no military authority can exercise any other functions than those intimately connected with military discipline. The state and the church are independent of each other, it being the exclusive right of the Federal Executive to exercise, in the matter of religious worship and external discipline, the intervention prescribed by law. Marriage is a civil contract, which, like any other act of the civil state of individuals, falls under the exclusive jurisdiction of the civil officials and authorities, as prescribed by law and having only the force and validity that law accords it. The Constitution is inviolable.

ARMY AND NAVY.

At the close of the protracted period of wars and revolutions which had distracted the Republic the Mexican army lacked, in general terms, the technical instruction and organization impossible to attain in the midst of active warfare. Since the establishment of peace the Government has taken two steps of prime importance toward the improvement of the army and navy of the country—one the complete reorganization of both branches of the service, and the other the reduction of the standing army. To this end the Military School, which has furnished many intelligent officers and engineers, has been reorganized. There is also a Naval Academy for the training of officers, a school of marksmanship, a school for the training of military bands and, distributed throughout the country, are 187 academies for the instruction of citizens who desire to enter the second reserve of the army. The old infantry armament has been replaced by the latest improved arms; the most modern ordnance has been substituted for the obsolete artillery pieces; the national arms and powder factories have been equipped with the most improved machinery, and, in short, everything has been done to place the army of the Republic on a footing with the general progress of the nation.

All Mexicans capable of bearing arms are obliged to serve either in the regular army or the national guard. The army is composed of regular and auxiliary troops of the reserve. The strength of the regular army is fixed by law at 30,000 men, that of the reserve at 28,000 men, and that of the second reserve at 150,000 men. The troops are not formed into army corps except in case of mobilization.

Shortly after the restoration of the Republic, in 1867, the army consisted of 37,103 privates, officered by 11 major-generals, 73 brigadier-generals, 1,041 colonels, lieutenant-colonels, and majors, and 2,335 commissioned officers.

At present the regular army establishment is made up as follows:

Infantry.—Twenty-eight battalions, 4 skeleton battalions, 2 companies of District troops, 1 section of scouts, the auxiliary troops of Sonora (18 officers and 219 men), and the Yucatan guard (21 officers and 401 men).

Cavalry.—Fourteen regiments and 4 skeleton regiments, Federal Auxiliary Corps (15 officers and 298 men), and the Sonora Auxiliaries (62 men).

Artillery.—Two regiments of mounted, 1 regiment of horse, 1 regiment of mountain, 1 troop with rapid-fire guns, 1 train, 1 battery and 3 sections of garrison, 1 company of mitrailleuse. Further there are 1 battalion of sappers and miners, 1 park of engineers, 1 troop of transport, 1 signal corps section, 1 hospital corps.

Arms.—The infantry is armed with Mauser rifles of the pattern of 1901, 7 mm. caliber. The cavalry with carbines of same pattern. The

Artillery have Bange guns of 7.9 c. m. caliber. The mountain batteries have guns of the Gruson pattern. The reserves have the Mauser rifle of 1893. The machinery for the manufacture of ammunition was imported from Germany in 1902.

The strength of the army on peace footing was in 1902:

	Officers.	Men.	Horses.	Pack animals.
Minister of War, Staff, and President's Guard	384	101	66	.....
Administration	1,066	675	49	.....
Infantry	900	15,796	.....	907
Cavalry	575	6,800	6,569	588
Artillery	161	1,585	352	1,024
Engineers	63	725	19	286
Hospital Service	154	290	13	51
Invalid Corps	10	39	.....	.....

The effective strength in time of war is given at 3,500 officers and 120,000 men infantry, 20,000 men cavalry, and 6,000 men artillery.

Navy.—The navy consists of the *Democrata*; gunboat of the first class, 450 tons, 600 horsepower, 4 guns. *Libertad*, 430 tons, 400 horsepower, 5 guns. *Zaragoza* (school-ship), 1,200 tons, 1,300 horsepower, 8 guns. *Oaxaca*, transport; *Yucatan* (sailing ship), and 2 schooners. Two combined gunboats and transports, *Tampico* and *Veracruz*, are under construction at Elizabethport, N. J., and 2 other gunboats are being built in Italy. The personnel of the navy consists of 130 officers and 292 men.

CHAPTER V.

POLITICAL DIVISION—THE VALLEY OF MÉXICO AND THE FEDERAL DISTRICT—CAPITAL CITY, PRINCIPAL BUILDINGS, PUBLIC INSTITUTIONS.

POLITICAL DIVISIONS.

Territorial division.—The territory of the United Mexican States (Estados Unidos Mexicanos) is divided into 1 Federal District, 27 States, and 2 Territories, whose organization is almost identical with that of the American Union. The States, as before indicated, are free and sovereign in all matters pertaining to their internal administration, their government being vested in three heads, namely: State government, State legislature, and State judicial power. The States and Territories are, for convenience, classified as follows, according to their situation:

Central States.—Federal District, Aguascalientes, Durango, Guanajuato, Hidalgo, México, Morelos, Puebla, Querétaro, San Luis Potosi, Tlaxcala, and Zacatecas, with and area of 372,480 square kilometers.

Northern States.—Chihuahua, Coahuila, Nuevo Leon, and Sonora, measuring 658,032 square kilometers.

Gulf States.—Campeche, Tabasco, Tamaulipas, Veracruz, Yucatán, and Territorio de Quintana Roo, 323,610 square kilometers.

Pacific States.—Baja California, Colima, Chiapas, Guerrero, Jalisco, Michoacán, Oaxaca, Sinaloa, and Tepic, whose combined area measures 629,037 square kilometers.

The two Territories are Tepic and Baja (Lower) California.

The Valley of México.—The picturesque and extensive valley of México comprises an extensive plain, broken occasionally by isolated hills and surrounded by two large mountain chains. Several ranges cross the valley west and south, while on the east rises the great Sierra Nevada, formed by the majestic Popocatepetl and the Ixtacihuatl, the former rising 3,200 meters above the mean level of the valley and 5,452 meters above sea level and the latter 5,286 meters above the level of the sea. The northern boundary of the valley has not yet been defined. The area of the valley is given as 4,214 square kilometers, not including the 1,532 square kilometers of the Zumpanga Valley, but both should be considered as forming one single valley, whose combined area is 5,746 square kilometers.

The waters of the valley form two distinct watersheds, one sloping in an easterly direction and the other toward the west, both embracing a number of small streams. Spurs of the lateral mountain ranges close the valley north and south, its center thus forming a basin where the waters of the two watersheds collect, forming five lakes, namely: Zumpango, 2,284 meters above sea level; Xultocán and San Cristobal, in the north, 2,277 meters above sea level; Chalco and Xochimilco, in the south, 2,280 meters and 2,268 meters, respectively, above sea level; and Lake Texcoco, on whose western shore lies the city of México. This last is the largest of all the lakes, being at the present day about 30 square kilometers in extent, though in former times it covered a larger area. As it lies in the lowest point of the valley all the surplus water of the other lakes drain into it during the rainy season, thus causing frequent inundations in the capital, to prevent which a system of drainage has been established.

The "Guia General Descriptiva de la República Mexicana,"[a] from which the information in regard to the Federal District has been obtained, divides the work undertaken for the proper drainage of the valley of México into four epochs. In the year 1449, during the rule of Moctezuma, the first dams connecting Tenochtitlán (México) with Tepeyac (Guadalupe) and Xochimilco were constructed. During the Colonial Empire (1553) a curved dam was built to replace those destroyed by Cortés during the war, others being built in 1604 and 1708. During the republican régime President Comonfort, in 1856, invited the competition of experts, both native and foreign, whose plans for the drainage works should fulfill certain conditions, among them being the stipulation that the waste waters be always used for irrigation purposes. Of the seven projects presented that of Engineer Francisco Garay was selected, and the work has lately been finished in accordance with his plans. The delay in the completion of the work was due to several disturbances in the country until, in 1885, President Díaz approved an appropriation of $400,000 a year for the continuance of the work until it should be finished, which was successfully effected in 1896 at a cost of $13,000,000. The work on the main canal, which necessitated the removal of 10,215,000 cubic meters of earth, kept 3,000 men and 5 dredging machines constantly employed. During the progress of the work upheavals of the soft bed of the canal occurred several times, thus rendering it necessary to commence the work anew. The canal starts at a point east of the city about on a level with Lake Texcoco, 1.30 meters below the mean level of México, crosses the river Guadalupe by means of an aqueduct 50 centimeters above the mean level of the river, extends for a distance of 48 kilometers, penetrating deeper and deeper into the earth until it enters a tunnel 10 kilometers in length, constructed at a slight incline and furnished with ventholes

[a] Compiled by J. Figueroa Domenech- Araluce, publisher, México, 1899.

to a depth of 94 meters. The works are provided with a system of lock gates, which insure control of the waste waters and regulate the level of Lake Texcoco, thus preventing inundations. The works were formally inaugurated on March 17, 1900. Their entire cost from 1886 to June 30, 1900, when they were finally delivered to the department of communications, is estimated at $15,967,778.[a] The valley of México has undergone a great modification with the opening of the main canal. The waters, which formerly emptied into the small lakes, and owing to the configuration of the land, had no natural outlets, thus constituting at times centers of infectious diseases, are now drained into Lake Texcoco and can be controlled at will, either allowed to flow out when too abundant, or retained for irrigation purposes in case of need.

Climate of the valley.—As the valley is situated within the torrid zone its climate might naturally be expected to be exceedingly hot, but as its altitude above sea level is 2,280 meters, the mean temperature is that of the temperate zone. During the summer the maximum temperature is reached at 2 o'clock in the afternoon in the months of April and May and does not exceed 26° C. (78.80° F.), while the lowest temperature in the morning during the same months is about 10° C. (50° F.), the mean temperature being from 18° to 19° C. (64° to 66° F.). During the winter the minimum temperature recorded in the mornings of November, December, and January, is about 2° C. (35° F.), while the maximum experienced during the same months is from 19° to 20° C. (66° to 68° F.), the mean temperature being, therefore, about 12° C. (53.60 F.). As indicated by these figures the mornings are cool and pleasant all the year and the afternoons temperate. There are only two seasons—the dry season from October to March, and the rainy season from April to September. The rainfall throughout the year is not very heavy, but as it is all utilized in the valley for irrigation purposes, it equals in its effect a much larger quantity. The winds blow from the northeast, but are never so strong as to become hurricanes.

Natural products.—The natural products of the valley are exclusively of an agricultural character and in keeping with the aridity of the soil, corn, wheat, and vegetables being the leading products in the order named. The "maguey" grows well, also certain fruits, such as the "zapote," peaches, apples, etc. The abundance of flowers during the whole year throughout the valley is as remarkable as the lack of mineral wealth, so plentiful elsewhere within the Mexican territory.

Federal District.—The Federal District,[b] population 541,516, lies to

[a] Except when otherwise specified, all values from Mexican official statistics are in Mexican silver.

[b] The population given throughout the book is according to the latest corrections to the census of 1900.

the southeast of the valley, between 19° 3′ and 19° 31′ north latitude and 10′ 40″ east and 11′ 45″ west of the meridian of México. At its greatest length the District measures 49 kilometers from southeast to north, and its extent east and west is 40 kilometers. Official data in regard to the area give it as 1,498.75 square kilometers. Nearly one-half of the rural inhabitants of the District are Indians engaged in agricultural pursuits.

Public instruction.—The total number of primary government or free schools in the district in 1902 was 337, of which 143 were for males, the same number for females, and 51 for both sexes, the total number of students registered being 55,113. There were also 3 secondary or preparatory schools, the average attendance for both sexes being 1,631 per annum, and 13 government professional schools, besides 171 educational institutions controlled by private individuals.

Vital statistics.—Demographic statistics for 1902 show that the number of births in the Federal District in 1901 was estimated at 16,261, of which 8,371 were males and 7,890 females. The number of deaths for the same period was 29,285, of which 15,265 were males and 14,020 females, or 28,985 Mexicans and 300 foreigners.

Telegraphs and telephones.—According to the latest official data (1902) there are in the Federal District 107 kilometers of Federal telegraph lines, and 1,692 of Federal telephones.

Political divisions.—The Federal District is divided into six *prefecturas* and one municipality, as follows: Prefecture of Guadalupe-Hidalgo, Atzcapotzalco, Tacubaya, Tlálpam, Xochimilco, and Coyoacan, whose chief towns bear the name of the respective prefectures, and the municipality of México, capital of the Republic.

Prefecture of Guadalupe-Hidalgo.—Population, 16,761; embraces the northern portion of the district, being divided into two municipalities: Ixtacalco and Guadalupe-Hidalgo. The chief town of the prefecture is in constant communication with the capital by means of tramways. The municipality of Guadalupe is celebrated on account of the temple dedicated to Our Lady of Guadalupe, the patron saint of the Republic, who, according to tradition, appeared on the hill of Tepeyac within the town of Guadalupe. The soil of the prefecture is barren toward the east, but salt deposits, left through the evaporation of Lake Texcoco, are abundant, the main sources of exploitation being chloride of sodium, carbonate of soda, and nitrate of potassium. There is also a petroleum well at Guadalupe, and the surrounding hills yield fine building stones. There is not a great variety of vegetation, it being confined almost exclusively to the western portion of the prefecture, the leading produce being corn, vegetables, and maguey.

Prefecture of Tacubaya.—Population, 37,695; occupies the southeast portion of the Federal District and is formed by four municipalities: Tacubaya, Mixcoac, Santa Fé, and Coaximalpa. The chief town is

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Tacubaya, the principal pleasure resort of the valley, and possessing fine buildings and gardens. The National Astronomic Observatory is a handsome building of modern architecture, erected on the highest point of the town, and containing some very fine instruments. The San Miguel and Monte de las Cruces mountain peaks form the southern boundary of the prefecture, and several streams originating on their slopes irrigate the land, which is the best agricultural section in the whole district, and supply drinking water for the city of México. As is the case throughout the entire district, corn is the chief agricultural product, though in Tacubaya and Mixcoac floriculture is carried on extensively, this industry giving rise to floral expositions and fairs. Fruits may also be cultivated with care.

Prefecture of Tlálpam—Population 22,962; embraces five municipalities. It is situated between Tacubaya on the west, Xochimilco on the east, México on the north, and the States of México and Morelos on the south. Tlálpam is also the name of its chief town, which, after Tacubaya, is the principal summer resort for the inhabitants of the capital. Situated on a picturesque spot, where the mountain slopes merge into the plain, it presents the peculiarity of possessing fertile lands in one section and absolutely sterile soil in another. The municipality of San Angel is noted on account of the "Feast of Flowers" held there, when prizes are awarded to cultivators of fruits and flowers. Embellished with innumerable gardens, filled with the richest flowers, and orchards producing the finest fruits and vegetables, and enriched with palatial dwellings, there are few more charming spots in the world. The southern portion of the prefecture embraces the slope of Mount Ajusco, whose ramifications extend northwardly as far as San Angel and Tlálpam, where the plain commences. The small streams of the locality empty into the canal of Xochimilco.

Prefecture of Xochimilco—Population 52,025; occupies the eastern and southern portions of the district and contains nine municipalities. Xochimilco, the chief town, is one of the oldest cities of the Anahuac Valley. It lies on the shores of what was formerly Lake Xochimilco, which no longer exists in its original form, the waters having been drained into numerous canals for the advantageous irrigation of the now fertile lands surrounding it. The leading products are the same as in the other prefectures. The topography of this region is varied, and while it is not traversed by a single natural stream, the soil is extremely fertile, as the several canals carrying the waters of the rivers Tlalmanalco and Tenango to the Xochimilco Canal irrigate the lands, and in the mountainous region of the south sufficient moisture is supplied by the frequent rains to maintain a vigorous vegetation, corn being the principal product. The produce of the region is transported to the capital in canal boats. The other municipalities are Coyoacan and Atzcapotzalco, 23,164 and 20,011 inhabitants, respectively.

Physical features.—From the foregoing it is evident that mountains and valleys are the main physical features of the Federal District. To the north rise the ramifications of the Sierra de Guadalupe, from 200 to 230 meters above the level of the capital, while the east and center is an extensive plain broken only by the Santa Catarina and Estrella mountains, respectively 200 and 150 meters above the level of the city. Sedimentary soil to a depth of 50 meters is found all over the plain, while the mountain regions are composed of eruptive rocks and granite. The small valleys between the mountains contain abundant vegetable matter.

Value of property.—The area of cultivation in the Federal District is about three-fourths its whole extent. The value of property varies according to irrigation facilities and the means of communication. Public lands fluctuate between 18 and 20 cents per square meter, while other lands, in better condition, command as much as 50 cents. Within the City of México property in the northern, southern, and eastern sections is quoted at 2 to 6 pesos[a] the square meter; from 30 to 35 pesos on the west side, and in the central section as high as 200 pesos per square meter.

THE CAPITAL CITY.

Municipality of México.—The municipality of México embraces the capital proper and the surrounding country, its maximum radius being 8 kilometers, with a population of 368,898. Besides the city proper, the other points of interest in the municipality are Chapultepec, Santa Anita, and the Hot Springs of El Peñón.

The Capital City.—The City of México, 2,229 meters above the sea, population 344,721, is one of the most ancient cities of this continent, having been successively the capital of the Aztec Empire, of the Spanish colony of New México, and now of the Republic, being, in addition the chief town of the Federal District.

Its foundation dates from 1325 or 1327, when the Aztecs, after long wanderings, were directed by the oracle to settle on this spot where they had seen the auspicious omen of an eagle perched on a nopal (cactus) devouring a snake, which is at present embodied in the coat of arms of the Republic.

The original name of the city, Tenochtitlán ("cactus on a stone"), was changed afterwards to México, in honor of the war god Mexitli. The Aztec civilization gave great impetus to the city's development, and in 1450, or about that time, the mud and rush houses of the first inhabitants had been replaced by solid stone structures. It had attained its highest degree of splendor at the time of the arrival of the Spaniards (1519), the number of dwellings being from 50,000 to 60,000,

[a] One peso is equal to $0.461 American gold, as officially estimated on January 1, 1904, by the director of the United States mint.

and the population being estimated at 500,000. The city was then about 12 miles in circumference and was intersected by canals, and, as it had been built in part on piles amid the islets of Lake Texcoco, grouped around the center inclosure of the great Teocalli, it was connected with the mainland by six long and solidly constructed causeways. México City has been the scene of many stirring events; among others, the destruction in 1692, while under Spanish rule, of all the municipal buildings; several revolutions; capture by the United States Army after the battle of Chapultepec, September 13, 1847, and by the French army under General Forey in 1863. Since the defeat of the French intervention scheme in 1867, and the overthrow of Maximilian, peace has been maintained continually and the city has become a great center of civilization.

The limits of the present City of México embrace almost twice the area of the old one, the extension having been in a northwesterly direction, and the new portion not being so regularly laid out as the old. There are about 900 streets and lanes traversing the city at right angles from north to south and from east to west, and rail connections with Veracruz, 263 miles distant, on the Atlantic; with Acapulco on the Pacific, 290 miles; with Oaxaca, 205 miles; with Matamoras, on the United States frontier, 863 miles, and with El Paso, Tex., a distance of 1,224 miles.

Climate.—The climate of the City of México is probably the pleasantest and healthiest of any large city in the world. Situated in the Tropics, it is generally regarded as having a tropical climate, with intense heat in the summer months; but its altitude of 2,229 meters above sea level offsets its low latitude, tempers its climate, and renders impossible such marked changes in temperature as are experienced at lower altitudes. Its situation in the center of a great valley, some 200 miles in circumference, completely walled in by high mountains, serves as a further protection against sudden changes in temperature and severe storms. The mean annual temperature, in the shade, of the City of México for the period of twenty-five years past has been about 15° centigrade or 59.79° F. The month of May, just preceding the beginning of the rainy season, is the hottest month of the year, with an average temperature of about 18° centigrade or 64.58°; and December, with an average temperature of 12° centigrade or 53.60°, is the coldest.

While the temperature varies only a few degrees throughout the year, the daily range is comparatively great, due to the high altitude. There is always a marked difference between sun and shade temperatures and between day and night temperatures. The latter is an advantage rather than a drawback to the climate. Thus, while it is quite warm during several hours of each day, it is always cool at night.

Principal buildings.—Among the principal public buildings are the Cathedral, considered the largest and most sumptuous church in America. It is built on the north side of the Plaza de la Constitución, which covers 14 acres, and is embellished with shade trees, gardens, marble fountains, and seats. The Cathedral was founded in 1573 by Philip II, of Spain, and the work lasted through the reigns of four monarchs, extending nearly a century, and was completed, with the exception of the towers, in 1667, at a cost of $2,000,000. It is built on the same site once occupied by the Teocalli, or Aztec Temple, and measures 130 meters from north to south and 60 meters from east to west. The interior belongs to the Doric order of architecture, mingled with reminiscences of the Gothic style, a feature of the Spanish constructions of the sixteenth century. It is divided into 5 naves, decreasing in height from the center to the sides, and includes 14 chapels, while 20 striate columns support the graceful arches and vaulted roof, forming a latin cross, and the whole is surmounted by a beautiful dome, ornamented with paintings by the celebrated Jimeno. The high altar is supported by marble columns and surrounded by a tumbago balustrade, with 62 statues of the same rich gold, silver, and copper alloy serving as candelabra. The elaborately carved choir is also inclosed by tumbago railings weighing 26 tons and valued at $1,500,000. The style of the exterior is Renaissance, with 5 domes and 2 open towers 62 meters high. Other temples worthy of mention are the Profesa, Loreto, Santa Teresa, Santo Domingo, and San Hipólito, all of large proportions and containing artistic relics.

The National Palace (Palacio Nacional) is another of the most remarkable public buildings, as it is intimately connected with the history of the country, having been once the sumptuous abode of Moctezuma II, last but one of the Aztec Emperors; also the residence of 5 Spanish Governors (from Cortés to Gonzalo de Estrada) of 2 *Audiencias*, of 63 Viceroys (from Don Antonio de Mendoza to O'Donojú), of 1 Mexican Emperor, Yturbide, of 1 foreign Emperor, Maximilian, and of 33 Presidents of the Republic, from General Victoria to General Díaz, the present Chief Magistrate. The architecture of the building is poor and monotonous, and nothing remains of its former Aztec splendor. The area occupied by the palace measures 40,000 square meters, thus constituting one of the largest public buildings in the world, and includes the following departments: The Presidential suite of reception rooms; the Ambassadors' room; five Executive Departments (Interior, Foreign Affairs, Treasury, War, and Justice); the General Archives of the Nation; General Post-office and Engineers' headquarters; the Artillery headquarters; the National Museum and Observatory; the Meteorological Bureau, and others.

The Castle of Chapultepec rises from the top of a hill, west of the city, amid century-old trees and beautiful gardens. Both the castle

and the location are full of historic memories. The interior of the structure is tastefully and richly decorated, it being the summer home of the President. Its spacious rooms and galleries contain the finest rugs and Gobelin tapestries, beautiful frescoes in the Pompeian style, and artistic furniture of red African marble. The Military School occupies a portion of this building.

There are many other fine buildings in the city too numerous to mention separately. Among the public monuments are found the statue of Charles IV, the monument to Columbus, the monument to Cuauhtemoc, all on the "Paséo de la Reforma," the richest and most beautiful park in this city.

The principal theaters are the "Teatro Nacional," or opera house, with a seating capacity of 3,000 persons; the "Teatro Principal," a small building; the "Circo Orrín," and others. There are also two bull rings, a race track, etc.

Public institutions.—The School of Mining and Engineering is another remarkable building, constructed entirely of stone, and dating from the last century. Its façade is Doric and of imposing and severe beauty, while the interior, of the same architectural style, is ornamented with several frescoes by Jimeno. The School of Engineering is now annexed to the School of Mining, and possesses an astronomical and meteorological observatory, a library containing over 6,000 volumes, and cabinets of mineralogy, geology, and paleontology. The Department of Fomento (Promotion) occupies a portion of this building, where it has its own printing establishment.

The National Library was originally built for a church, being dedicated to St. Augustine in 1692, but in 1867 President Juarez devoted it to its present use. It is a massive stone structure of varied architecture and consists of three sections—the main structure, ornamented with the statues of ancient and modern celebrities, is devoted to the reading room; the library proper, containing over 200,000 volumes, and the whole building is surrounded by gardens and inclosed within an iron railing, with stone columns at regular intervals, upon which are erected 20 busts representing as many Mexican celebrities, among others being Tezozomoc and Ixtlilxóchitl, Aztec chroniclers; Netzahualcóyotl, the poet king; Clavijero and Alamán, historians, etc.

Besides the National Library, the city possesses 32 others, both Federal and private libraries, among which the following may be mentioned: The School of Jurisprudence, 20,000 volumes; the "Cinco de Mayo," 12,000; Preparatory School, 10,000; School of Engineering, 8,000.

The National Museum dates from the eighteenth century, and contains many objects of archæological, ethnological, anthropological, and historical value. There are other museums, 11 scientific and literary associations, 2 observatories—the National, already mentioned, and the

one belonging to the School of Engineering—a Conservatory of Music, and several scientific associations. According to the census of 1900, there were in México City 15,042 dwelling houses of all classes and 539 in course of construction, 56 hotels, 16 hospitals, 51 colleges, 4 public jails, 1 penitentiary, 1 house of correction, 17 barracks, 80 Roman Catholic temples, and 13 churches of all other denominations.

According to the latest available data, in 1902 there were in the City of México 94 daily papers and magazines, reviews, weekly and fortnightly publications entered in the post-office, published in Spanish, English, French, and German.

Means of communication.—The City of México being both the administrative and the commercial center of the Republic is the focus of all the railways from the States, whose tracks are also used for the service of the District. The National Railway, which connects the Republic with the United States, passes through Tacuba and Atzcapotzalco; the Mexican, connecting the capital with Veracruz, passes through Los Reyes and the Cuernavaca through several other towns. The steam railroads operating solely within the District are the Tacubaya Railway, connecting with the lines going west to Santa Fé and south to Tizapán, and the Tlálpam Railway, which goes through Churubusco, San Antonio, Santa Ursula, and Hueypulco. Other important railways of the District are the tramways of the capital, leaving the city about every half hour and connecting it with several adjacent towns. These are the Tlanepautla line, which runs through Tacubaya and Atzcapotzalco; the line to Guadalupe; the line to the Hot Springs of El Peñón; the line of Ixtapalapa, connecting several small towns, and the Chapultepec line, with the railroad of Tlalpám. There are besides good wagon roads and the Xochimilco Canal, which is the medium of communication by boat. According to the "Guia General," there are in the District about 242 kilometers of railroads in operation, as follows: Standard gauge, 169 kilometers 325 meters, and narrow gauge, 72 kilometers 566 meters. Of these about 116 kilometers are street lines. A tabulated statement published by the same authority shows that from 1873 to December 31, 1897, the traffic over all lines of the District amounted to 244,637,816 passengers, and the gross earnings of the lines are estimated at $19,828,854 Mexican silver.

The report of the directors of the Mexico Electric Tramways Limited, for 1903[a] shows that during that year the net profits of the company, after paying the 3½ per cent guaranteed on the share capital of the company, were $314,566 silver, which, at the rate of exchange of 20.72d, gives the sum of £27,157. This sum added to former balances and other revenues from interests on the debentures of the "Compañía de Ferrocarriles del Distrito Federal," controlled by this company, gives a total of £35,728, out of which a dividend of 6 per cent has

[a] South American Journal, June 4, 1904.

been paid on the preference shares, amounting to about £30,000. Four small town lines have been converted to electric service, so that the total distance now operated by electricity by this company is 129 kilometers. New machinery is being erected to cope with the increase of the traffic. The number of passengers carried by these lines during 1903 was 36,478,584, against 31,132,030 in 1902, being an increase of over 5,300,000 passengers. The receipts amounted to $2,799,282 in 1903, against $2,400,787 in 1902, or an increase of $398,495.

As a commercial center the City of México is the richest in the country, possessing wealthy banking institutions, important railroads, telephones, telegraphs, electric light and power plants, manufacturing industries, large buildings devoted to stores and warehouses, and, in short, all the comforts and conveniences to be found in any large city.

Banks.—The principal banking institutions of the capital are the "Banco Nacional de México," with a capital of $20,000,000; the "Internacional Hipotecario," $5,000,000, and the "Londres y México," $10,000,000; "Banco Central," $7,000,000; "Banco Agrícola é Hipotecario," $2,000,000. Both the "Nacional" and the "Londres y México" have branches in several of the States.

The Central Bank, in addition to carrying on the usual banking business, acts in the capacity of a clearing house for a number of banks allied to it in other parts of the Republic. There are also numerous banking houses, bankers, and trust companies doing business with all commercial centers of the world. There are three chambers of commerce at the capital.

Industries.—The number of manufacturing industries established at the capital is very large, and includes wine and liquor distilleries, factories for pottery, tobacco, carriages, wagons, cardboard and paper, matches (wax and wooden), glue, chocolate, artificial ice, gloves, glass, cotton fabrics, knitted goods, soap, blank books, playing cards, furniture, hats, lace, etc., as well as foundries, breweries, and printing establishments. There are also several life and fire insurance companies, both foreign and national. The city possesses excellents hotels, restaurants, and cafés.

Water supply.—When the City of México was known during the time of the Aztecs as the "Nueva Tenoxtitlán," its drinking water was supplied by the spring called "Alberca Chica de Chapultepec." During the colonial period, in 1576, the Santa Fé springs were purchased, which now produce 6,000 liters of water per minute, and in 1786 water was furnished by the Desierto and Leones springs, which now yield 8,000 liters per minute. From that time down to 1888 the city council did not secure any other properties; but in that year it purchased the "Alberca Grande de Chapultepec," which gives 7,000 liters of water per minute. All these acquisitions, however, did not suffice to furnish this necessary element to the city.

In 1896 the city council, fearing a water famine, acquired a water supply from the Hacienda de los Morales, which gives 9,000 liters per minute, and also a supply of 800 liters per minute from the Concesión Chousal. Lastly, in 1899–1900, a supply has been secured from Río Hondo, which, united to that from Morales, produces 30,000 liters per minute. According to the statistics of 1901 the amount of water received in the city per minute was 40,000 liters, added to which is the supply from 1,088 artesian wells, yielding 16,640 liters per minute.

One of the most important municipal undertakings has been the construction of a sewage system for the city, which is regarded as one of the most perfect to be found anywhere. The system adopted is that known as the combined water carriage, and consists of three principal parts—flushing pipes, sewers to collect the house refuse, and collectors to receive this refuse and carry it outside the city. The sewers can be flushed every day by means of the water from the Viga Canal. The total disbursements on account of this sanitation project up to June 30, 1901, were $5,714,982.75.

The following data is extracted from a report of United States Consul-General Barlow:[a]

"*Commerce.*—The City of México is to the Republic of México, to an even greater degree perhaps, what Paris is to France. Being the capital of the country and the commercial center, with no other city in the Republic approaching it in population, its influence is supreme; being the railroad center, it is the distributing point for the rest of the Republic; being the banking center, the bulk of the financial transactions of the Republic pass through it. Much of the agricultural and mining business and some of the manufacturing business of the rest of the Republic are directed from this city. In a word, it is the administrative center of the Republic, commercially as well as politically.

From the foregoing it follows that the trade of the city is nearly as general as that of the entire Republic. The most important single line of trade and that which shows the larges amount of imports is in machinery and machinery supplies. This is practically controlled by Americans. The hardware trade, which is a good one, is largely in the hands of the Germans, though in the past few years American hardware has been making deep inroads into the German imports in this line. While the large hardware stores are run by Germans, all of them now carry large lines of American hardware. The dry-goods trade, which is next in importance after the machinery trade, was controlled early in the last century by the English and later by the Germans, but is now controlled by the French. Imports of American dry goods are increasing, however, and they are found in most of the large stores.

[a] Commercial Relations of the United States, 1901, Vol. I.

AVENIDA 18 PONIENTE AND MEXICAN NATIONAL RAILWAY STATION, CITY OF MÉXICO.

"*Cost of living.*—The cost of living in México depends largely upon the tastes and adaptability of the person. In a general way, it may be said that if native products are consumed the cost of living is about the same in gold as in the United States; if imported products are used the cost of living is 50 to 100 per cent greater.

Rents are extremely high. A six-room house or vivienda (flat) costs from $50 to $150 silver per month, according to location. The same house in a city in the United States, of similar size, would rent from $15 to $25 gold per month. A house that would rent in the United States, according to location and appearance, for $100 gold per month commands $500 silver (or about $250 gold) per month here. Rents of business houses are fully as high in proportion. It may be stated in a general way that private or business houses, rented, are expected to yield 12 to 15 per cent per year on the investment. Rents in the suburbs are almost as high as in the city proper.

"*Real estate.*—Real-estate values have increased enormously in this city in the past few years. Lots in desirable residence sections of the city that were worth a few years ago only a few cents per square meter are now worth from $15 to $25 per square meter. A desirable building lot in a choice location, 50 to 150 feet, costs from $10,000 to $15,000. In outlying sections and in the suburbs, the cost will be about one-half of this. A house that will cost $5,000 to build in the United States will cost from $17,000 to $20,000 Mexican silver to build in this city."

CHAPTER VI

THE STATES AND TERRITORIES OF THE REPUBLIC—BRIEF GEOGRAPHICAL SKETCH OF EACH—RESOURCES, MEANS OF COMMUNICATION—CLIMATE, SEASONS, POPULATION, CAPITAL CITIES, INDUSTRIES.

THE STATES.

The States forming the Mexican Republic are 27 in number, besides the Federal District and 2 Territories.[a]

AGUASCALIENTES.

The State of Aguascalientes, population 102,416, whose capital city, 1,861 meters above the sea, bears the same name, is situated in the Central Plateau, and, though one of the smallest States in the Republic, is also one of the richest, as it contains within its territory an agricultural region of great promise, and belongs, by reason of its altitude, to the Mexican temperate zone.

Boundaries.—It is bounded on the north, west, and northeast by the State of Zacatecas, which almost surrounds Aguascalientes, with the exception of a small section to the south, southeast, and east, where the State of Jalisco joins it. The total area of the State measures 7,692 square kilometers.

Situation.—Owing to its situation on the Central Plateau, Aguascalientes occupies a beautiful and fertile region, which is cultivated almost in its entirety, the western and central portions being irrigated by a number of rivers and brooks, while the eastern portion owes its development to the industry of the farming population. The eastern and southeastern portions are occupied by the extensive plains of Tecuán, which, though containing a large number of *haciendas* (plantations) and *ranchos* (cattle ranches), are lacking in water courses. The fertile valley of Aguascalientes, irrigated by a river of the same name, lies to the northeast, while the no less fertile valley of San Jacinto is farther north.

Climate.—The cold region of the State lies to the northeast, where the mountain chains of Asientos and Tepezalá rise to a height of 2,414 meters. The remainder of the territory, with the exception of a small section in the southwest belonging to the hot zone, is in the temperate region. Almost all the western and northern portions of

[a] See table on page 407, Chapter XIX.

the State are mountainous, being traversed by the Sierra Fria, and in the southwest are the mountains of the Sierra del Laurel. A number of plateaus and isolated hills and a few chains of mountains rise in the center of the State, so that the mean altitude is from 1,000 to 2,000 meters above sea level, excepting in the sections occupied by the Sierra Fria and the Sierra del Laurel, where the elevation varies from 2,000 to 3,000 meters.

Rainfall.—The rainfall throughout the State is moderate except on the eastern plains. Frost is frequent both in the highest regions and in the Sierras, notably in the Partido de Asientos, while in Calvillo it occurs rarely. The prevailing winds blow from the west, northwest, and north. The climate is rather unhealthy, typhus and malarial fevers and affections of the respiratory organs being the most common ailments.

Rivers.—As has been stated, the irrigation of the western and central portions of the State, by reason of numerous rivers and brooks, is of the finest order, but in the eastern part rain and artesian-well waters are alone available for this purpose. The principal river, the San Pedro, Aguascalientes, or Rio Grande, has its headwaters south of the Zacatecas Mountain chain and enters the State on the north, and after traversing its entire extent from north to south enters the State of Jalisco. Other rivers are the Pabellón, Santiago, Morcinique, Chicalote, Labor, Tejas, Calvillo, and Tepezalilla. There are also several lagoons or swamps, which are of little importance.

Mineral springs.—Aguascalientes (literally hot waters) derives its name from the several hot springs found within its limits, the principal ones being those in the capital of the State, San Nicolás de la Cantera, Ojo Caliente, Ojo Calientillo, and Colomo. The temperature of the waters in the several springs varies from 30° to 40.50° C. (86° to 105° F.).

Fauna and flora.—The fauna of Aguascalientes embraces over 27 classes of mammals, 58 species of birds, 9 reptiles, 5 batrachians, 4 fishes, and 74 insects. The flora embraces over 137 species of wild trees, while there are over 48 kinds of fruits; among others, 20 varieties of pears, figs, several kinds of grapes, 11 textile plants, several classes of tanning barks, leaves and roots, oleaginous seeds or berries, dye plants, forage plants, poisonous and aromatic plants, gums and resins, 103 medicinal plants, and numberless ornamental shrubs and flowers.

Resources.—The principal industries of the State are agriculture, stock raising, commerce, and mining. Almost its entire extent is under cultivation, the principal products being cereals of all kinds, fruits of every variety, and leguminous plants. Such products as the almond, cotton, citron, sugar cane, mangrove, and other tropical plants and trees would thrive.

Stock raising is carried on to some extent, and, while no statistical data in regard to the number and species of live stock can be obtained, the following official figures for 1902, taken from the "Anuario Estadístico," may give an idea of the extent of the industry. In that year there were slaughtered for consumption in the State 6,821 head of cattle, 4,982 sheep, 7,037 goats, and 9,071 hogs, valued at $465,996 silver.

Mining, which should be one of the main sources of wealth in the State, has been almost abandoned. The principal minerals found are copper, lead, silver, and magistral,[a] the former most abundant at Asientos and the latter at Tepezalá. The mining district, 63 kilometers northeast of Aguascalientes, is formed by a group of isolated mountains, whose highest points are the Altamira range and San Juan, Las Pilas, or Calavera. The number of copper and silver mines in operation during 1902 is officially estimated at 8, the total production being over 42,000,000 kilos, valued at $1,000,000 in round numbers.[b]

Trade.—The State of Aguascalientes is an important commercial center, exporting large quantities of corn and beans, especially to the City of México; flour and magistral to several mining districts (Zacatecas, Pachuca, Guanajuato, and other places in San Luis Potosí), cattle, horses, and mules to several points in the Republic, as well as fruits, lumber and timber, hides and skins, tallow, horns, etc. The State imports from the City of México and from Europe and the United States, through the ports of Tampico and Veracruz, groceries, ready-made clothing, cotton, wool, and silk fabrics, hardware, drugs, books, paper, chemical products, perfumery, arms and ammunition, furniture, glassware, wines and liquors, hats and bonnets, canned goods, jewelry, machinery and tools for agricultural, mining, and industrial purposes, carriages, etc. The total value of the trade of the State is estimated at about $7,500,000 per annum, divided as follows: Imports, $2,500,000; exports, $3,000,000; local trade, $2,000,000. The principal markets in the State are Aguascalientes, Rincón de Romos, and Calvillo.

Communications.—The Mexican Central Railroad crosses the State in two directions, from south to north the line from México to Ciudad Juarez, and from south to northeast the line from Aguascalientes to San Luis Potosí. The principal stations on the former line are Peñuelas, Aguascalientes, Chicalote, Las Animas, Pabellón, Rincón de Romos, and Soledad; and on the latter, Aguascalientes, Chicalote, Cañada, Gallardo, El Tule, and San Gil. The State is in telegraphic and mail communication with the rest of the Republic, and the telephonic serv-

[a] *Magistral* is a species of copper pyrites absolutely necessary for the so-called "patio process."

[b] Except when otherwise specified all values from Mexican official statistics are in Mexican silver.

ice is good and quite extensive. There are good wagon roads connecting the capital with the most important markets of the neighboring States.

Divisions.—The State is divided politically into four *partidos*, subdivided into eight municipalities. The *partidos* are the following:

Rincón de Romos or Victoria de Calpulápam, population 12,714, whose chief town, situated on the Mexican Central, 43 kilometers distant from the capital, bears the same name.

Ocampo or Asientos, population 15,486, chief town Asientos de Ibarra, 10 kilometers from San Gil, on the Mexican Central.

Calvillo, population 10,592, chief town bearing the same name, 627 kilometers distant from México City and 59 from Aguascalientes.

Aguascalientes, population 63,624; its chief town, Aguascalientes, contains 56,244 inhabitants, and is the capital of the State. It is situated on the Mexican Central, 586 kilometers from the City of México. Among the manufacturing industries of these partidos the principal ones are as follows: Cotton mills, tobacco factories, pottery works, tanneries, wagon factories, and wine and liquor distilleries.

In the city of Aguascalientes there are two lines of tramways; telegraph, telephone, and post-offices, schools, hospitals, public libraries, a chamber of commerce, etc., while all the principal towns in the State have similar institutions.

CAMPECHE.

The State of Campeche, population 86,542, with a capital city of the same name, near the level of the sea, lies to the southeast of the City of México, occupying the western portion of the beautiful and warm peninsula of Yucatán.

Boundaries.—Its borders are bathed by the waters of the Gulf of México on the west and northeast, while Yucatán lies to the north and east, the Republic of Guatemala to the southeast and south, and the State of Tabasco to the south and southwest.

Situation.—Campeche occupies a large territory, the climate of which is deadly in many sections, especially in the region of the southern plains. The area of the State is 46,855 square kilometers. From northwest to southeast the Sierra Alta crosses the territory until it meets the Sierra Baja, extending to the northwest of Yucatán. With the exception of this mountainous section, the State is a plain, occupied throughout its greatest extent by forests containing the campeche or logwood and other valuable woods. A portion of the southern region, contiguous to Guatemala, is little known and almost uninhabited, as it contains large savannahs, swampy lands, and impenetrable forests. The richest section of the State is occupied by the Partido del Carmen. It is well irrigated by both large and small streams, which empty into the numerous lakes and lagoons surround-

ing the Lake of Términos. The shores of the lakes and rivers are covered with forests containing dyewoods, hard woods, palm trees, etc. These waterways are the means of outlet for the trade in woods, which owes its development to the flourishing port of El Carmen or Laguna, opposite Laguna de Términos, which is, perhaps, the best harbor of the Mexican Gulf, Campeche scarcely ranking as such.

Climate.—The climate of the State is hot and unhealthy and the rainfall is moderate, except in Partido del Carmen. Frosts are unknown, and, owing to the swampy and marshy condition of the land, malarial fevers are very common.

Topography.—The Sound or Bay of Campeche extends along the coast of the State, forming many estuaries, points, bars, and some islands. The coast line is low, sheltered, and, in some places, muddy. Coral reefs and other calcareous banks are abundant. This bay, which is an inlet from the Gulf of México, has an area of over 6,000 square miles. The Banks of Yucatán, an enormous shoal extending along the coast of Yucatán opposite the Campeche coast as far as its Tabasco boundary on the west, have, according to soundings made by Mexican, American, and English sailors, a depth of 5 fathoms at a distance of from 5 to 7 miles from the shore; of 10 fathoms from 20 to 35 miles, and a depth of 20 fathoms as far as a 60-mile limit WNW. off Punta Palmas, and almost an equal distance to the south, and of 30 fathoms for a few miles along the western limit of the soundings. Beyond this the depth falls abruptly to 40 fathoms. Hydrographic charts prepared by American and English experts show the main irregularities and dangers to be encountered in the Sound of Campeche.

Hydrography.—The northern portion of the State, occupied by the partidos of Hecelchakán, Campeche, and Bolonchén, lacks water courses, the region being fertilized by the rains, temporary brooks, and wells (called *chenes*) used for storing the rain waters. The southern portion of the State is well irrigated, especially the partidos of Carmen and Champotón. The principal river is the Sabancuy, which might properly be called an estuary, being 92.50 kilometers in length and from 400 to 700 meters in width, lying to the northeast of the Partido del Carmen, navigable for small craft and emptying into the Lake of Términos. The bottom of this river is full of oyster beds. The river Marmantel rises in the Partido Champotón, traverses the Partido del Carmen from the southeast to the northwest, and empties into Lake Palao, with a total length of 98 kilometers. It is navigable for a distance of 39 kilometers and passes through forests of dyewoods and valuable timbers and cultivated lands. For a distance of 16 kilometers from its mouth the river measures 258 meters; thence its width is 25 meters up to the twenty-eighth kilometer, gradually narrowing to 4 meters at Pital and growing smaller and smaller toward its headwaters. The Candelaria, which is the largest river in the State, is supposed to

have its headwaters in Guatemala, and after traversing the State of Yucatán enters Campeche, irrigating the southern portion of the Partido de Champotón, thence running from east to west, and finally emptying into the Lake of Términos. Its length is about 419 kilometers and its width varies from 125 to 175 meters at a distance of 10 kilometers from its mouth to about 51 or 52 meters, with a depth of from 8 to 60 feet. It is navigable for a short distance only, on account of its precipitous course. The Chumpán, 95 kilometers in length, is navigable for small craft, its width varying from 62 to 84 meters and its depth from 12 to 24 meters, according to the season. It is a confluent of Lake Términos. The Palizada is also one of the largest rivers in the State. It rises in the State of Tabasco, enters the State of Campeche on the southwest, traverses it for a distance of 123 kilometers, from southeast to northwest, and empties into Lake Términos, forming the Boca Chica Bar. The Palizada is navigable for craft from 15 to 50 tons burden throughout almost its entire course, being 68 feet in depth, and having a mean width of from 60 to 66 meters. The Champotón, another river of importance, is navigable throughout its course, which is a very sinuous one. There are other rivers and streams of lesser importance. The Lake of Términos is the most important in the State. Its shores are muddy and shallow. It communicates with the sea by means of two channels, the Principal and the Puerto Real. The tides in this lake are very irregular, the greatest height during the syzygies being 2 feet. Other small lakes are San Carlos, Laguna Larga, Colorada el Corte, and a few small lagoons.

Fauna and flora.—The fauna of the State is rich and varied, though not very well known. There are about 50 species of mammals, 70 varieties of birds, 40 reptiles, 8 batrachians, 40 fishes, 75 insects, and many varieties of crustaceans, mollusks, etc. The flora embraces over 150 species of wild trees, 50 fruits, 28 textile plants, 20 classes of leaves, roots, and barks for tanning purposes, 16 oleaginous seeds, 24 dyewoods, 10 forage plants, 7 poisonous plants, 21 aromatic and a great number of medicinal plants, several gums and resins, and countless flowers and ornamental plants.

Resources.—The principal industries are the exploitation of cabinet woods, and the campeche or logwood (of first importance), commerce by land and sea, agriculture, stock raising, fisheries, exploitation of the salt deposits, extraction of the heniquén fiber and its manufacture into hammocks, ropes, mats, etc.

According to Mexican official statistics, during the year 1901 the State of Campeche produced 22,152,380 kilos logwood, valued at $569,548, while in 1902 the production decreased to 9,300,000 kilos, valued, in round numbers, at $353,000; mahogany was produced in 1901 to the amount of 22,152,380 kilos, valued at $142,674; cedar, in 1902, about 1,500,000 kilos, valued at $70,000.

Agriculture is one of the leading industries of the State, which possesses fertile lands well adapted to the cultivation of the fruits of the hot and temperate zones. Rice, sugar cane, cotton, and similar products might be advantageously cultivated in the southern part of the State, which is well irrigated, but the inhabitants devote their attention mainly to the exploitation of logwood and valuable timbers.

Mining.—The principal mineral wealth of the State lies in its salt deposits, extending from the port of Celestum (State of Yucatán) to the port of Campeche. The annual yield is estimated at 40,000 to 50,000 *fanegas*, exported to the States of Tabasco, Veracruz, Tamaulipas, Hidalgo, Puebla, and Oaxaca.

Trade.—The State maintains an active commerce with Europe and the United States, mainly in logwood and cabinet woods, the home trade being restricted to the salt exports (as above noted), shell products, palm hats, hammocks, etc., to the City of México, and the importation of cattle and cereals in limited quantities. When, on account of the lack of rain, there is a scarcity of corn, this grain, as well as other products, is imported from the United States. The principal mercantile centers are Campeche, Carmen, Calkiní, Hecelchakán, and Bolonchenticul.

The cabinet woods of the State are exported mainly to the United States and to Great Britain, the dyewoods to Great Britain, Germany, the United States, and France. Other exports are rubber, hair, cocoanuts, chicle, henequén, prepared hides and skins, etc. This commerce may be estimated at about $1,250,000 silver per annum. The imports embrace cotton, wool, silk, and linen fabrics; groceries, hardware, drugs and chemical products, paper, books, machinery, tools, agricultural implements, arms and ammunition, cereals, cattle, wines and liquors, etc. This trade is valued at about $500,000 annually. The number of vessels entering the port of Carmen in 1902 was, according to Mexican official data, as follows: 128 steamers, 176 sailing vessels; total, 304 vessels, of which 225 were Mexican and the balance foreign. The vessels entering the port of Campeche during the same period were 821, of which 133 were steam and the balance sailing vessels. The total number of vessels leaving both ports is estimated at 833 for Campeche and 283 for Carmen.

Communications.—The development of railroad traffic in Campeche is very small, due to the fact that the rivers are used as a means of communication with the interior and also that the principal towns are all situated on the seacoast. The railroad between Campeche and Mérida is being exploited in sections, and between Campeche and Lerma there is a street railroad 7 kilometers in length, other lines being in operation in the cities of Campeche and Carmen. In the partido of Champotón there is a railway 40 kilometers in length connecting Ivonchac with Yohaltún. There are also telegraph and

telephone lines, mail facilities, and fine wagon roads connecting the principal cities with those of the adjacent States, while steamship lines connect the principal ports with the rest of the world.

Divisions.—The State of Campeche is divided into five partidos, which are subdivided into municipalities.

The partido of Hecelchakán, population 24,185, has for its chief town a city of the same name, situated on the railway between Campeche and Mérida, 38 kilometers northeast from Campeche.

Campeche, population 23,588, is the smallest, but also the richest, of the five partidos, the chief town of which, Campeche de Baranda, population 16,647, is also the capital of the State. It is situated on the Gulf of México, 1,320 kilometers from México City, 930 from Veracruz, and 164 from Mérida. This city is the second in importance on the peninsula of Yucatán and is one of the richest and most beautiful on the Gulf. The Campeche wharf is 150 feet long, but owing to the fact that the depth of the harbor is only about 10 feet, heavily laden ships can not anchor there. Among the principal buildings are the City Hall, the Government Building, the hospital, a bank, a theater, the market, and several churches. There are also a fine park and public gardens, schools, and colleges, with a public library containing 3,600 volumes and a museum of natural history and an achæological museum. The leading industries of the partidos are commerce, agriculture, fisheries, the exploitation of the salt deposits, etc. An active commerce is maintained with the Mexican ports of Veracruz, Frontera, Carmen, and Progreso, and also with the ports of Havre, New York, and Santander, the main exports being hemp, dyewoods, salt, etc. In the city of Campeche are two street railway lines, measuring 2 kilometers and 2.8 kilometers, respectively, and from that point are lines running to Lerma and Mérida, the former being 6 kilometers in length and the latter 53 kilometers. The following lines of steamers touch at Campeche: New York and Cuba Mail Steamship Company, from New York; the Harrison Line, from Liverpool and New Orleans, and Escalante e Hijo, (Mexican) from home ports.

The partido of Champotón, population 7,781, has a town of the same name for its industrial center, situated on the Gulf of México, 60 kilometers southwest of Campeche.

The partido of El Carmen, population 16,943, with a principal town and port of the same name, situated 1,152 kilometers from México City, and 168 kilometers from Campeche, comprises one of the richest and most important sections of the State, being celebrated for its dye and precious woods. There are several lakes in the partido, and it is said that the harbor of Carmen is the best on the Mexican Gulf. The commercial movement is estimated at about $1,500,000 per annum, as it is the port of departure for the exports of forest products for the entire State.

Partido of Bolonchén or Los Chenes, population 5,734, has for its principal town Bolonchenticul, situated 62 kilometers east of Campeche. The celebrated cavern of Bolonchenticul is found 2 kilometers west of the city. In it are seven wells, from which the people obtain their water supply when the public wells fail, respectively called in the Maya language, *Chac-ha* (red water), on account of the color; *Puxalhá* (escaping water), because of the ebb and flow of the well, the waters receding at certain periods; *Sayab* (spring water); *Akab-há* (dark waters), because of the obscurity of the place; *Choco-há* (hot water); *Oxil-há* (milk water); and *Chimez-há* (insect water), because of the insect *chimez* which abounds in great numbers at the well. The cave is entered by means of ladders made of branches of trees, and its depth, to the first well, has been estimated at 1,400 feet.

CHIAPAS.

The State of Chiapas, population 360,799, whose capital is Tuxla Gutierrez, 530 meters above the sea level, population 22,536, lies to the southeast of México City on the Guatemalan boundary. It is one of the tropical sections and has a great future as an agricultural country, the wealth of its flora being little short of marvelous.

Boundaries.—The boundaries are the State of Tabasco on the north, Veracruz and Oaxaca on the west, the Pacific Ocean on the south, and the Republic of Guatemala on the east. Its area is about 70,524 square kilometers.

Situation.—The southern portion of the State is traversed by the Sierra Madre Range, which is a continuation of the Andes of South and Central America. To the south of this range extends a narrow strip of land, varying from 10 to 39 kilometers in width and reaching to the Pacific Ocean, which forms one of the most fertile regions of the Mexican hot lands, where cacao, coffee, indigo, sugar cane, etc., thrive, and forests of cabinet and dye woods, medicinal plants, palm trees, mangrove, and timber are abundant. All this section is irrigated by numerous rivers draining into the Pacific from the slopes of the Sierra Madre. The volcano of Tacaná, whose snowy peak is 3,990 meters above the level of the sea, rises in this region, and on its slopes are cultivated potatoes, wheat, and other products of the cold zone. The boundary line between México and Guatemala crosses the top of Tacaná. The Pacific Ocean bathes the coasts of Chiapas for a distance of 220 kilometers, from its Oaxaca boundary line to the bar of the Sachinate River, on the Guatemalan boundary. The coasts are generally low and sandy and well sheltered, and do not present any obstacles to navigation.

Climate.—Although the entire territory of Chiapas belongs to the torrid zone, the climate varies according to the altitude, being hot on the coast and the lands irrigated by the Chiapas River; humid and

unhealthy on the low marshy lands, especially at Tonalá, cold in the valley of San Cristobal, and in the rest of the State it is generally temperate. Rain is abundant, except in the departments of Comitán, Chiapas, La Libertad, and Tuxla Gutierrez. There are occasional frosts in the valley of San Cristobal, but other sections of the State are rarely if ever visited by them. The winds are very variable. Malarial fevers, typhus, smallpox, and affections of the respiratory and digestive organs are the most common diseases.

Topography.—The Andes Range from Central America traverses the State, running almost parallel to the coast, at a distance varying from 8 to 39 kilometers. This range is called the Sierra Madre, and from its main line several branches diverge, encompassing the fertile open valleys of Custepeques, Jiguipilas, Zintalapa, and Chiapas, and the inclosed valley of San Cristobal. In addition to the volcano of Tacaná other remarkable mountains are the Tres Picos, north of Tonalá, and the Gineta, on the Oaxaca boundary line. There are also the Cungozoe or Plumas and other small ranges. The eastern plains of Chiapas, known as the "Desierto de los Lacandones," have not yet been thoroughly explored. They are irrigated by the Usumacinta River. To the west of the Chiapas Valley lies that of Zintalapa, which is a desert tract of land, being an extension of the swampy region south of the Chimalapa Mountains in the State of Oaxaca.

Hydrography.—Chiapas is one of the least irrigated sections of the Mexican Republic. The principal river is the Chiapa or Mezcalapa, which has its origin on Guatemalan territory. It enters the State of Chiapas near Amatenango, traverses the central part of the State in a northwesterly direction, and finally empties into the Gulf of México in the vicinity of Frontera (State of Tabasco), having in its entire extent a length of 554 kilometers. It is known by several names in the different parts of its course, irrigates the principal sections of the State, and is the boundary between Chiapas, Veracruz and Tabasco. This river receives the waters of numerous affluents and, on account of the strong currents and the large volume of water contributed by its branches, is navigable throughout a great portion of its extent. The Usumacinta River, which irrigates the northwestern section of the State, rises in Guatemala, between which Republic and Chiapas it forms the boundary line. Its many branches are navigable throughout, and serve as irrigating streams for the "lacandones" land and the States of Campeche and Tabasco. Its final outlet is into the Gulf of México, after a course of 550 kilometers. The two rivers above named constitute the hydrographic system of the State, the Chiapas traversing it for a distance of 390 kilometers, while the other rivers and streams are of minor importance. The Lake of Chiapas or Tepancuapan, situated 45 kilometers west of the city of Comitán, 1,447 meters above the level of the Pacific Ocean, belongs to the

fluvial system of the Usumacinta River. Its extent is 11 kilometers east and west and 5 kilometers north and south. It contains an abundance of fish. This is also the case in regard to the Lake of Islotes, which lies in the immediate vicinity. Other lakes, and many of lesser importance, are the Catazayá and Jumajab.

Fauna and Flora.—The fauna of the State is rich and varied, embracing 60 species of mammals, 100 birds, 40 reptiles, 9 batrachians, 40 fishes, and numberless insects, myriapoda, crustaceans, mollusks, corals, sponges, etc. The cochineal (*coccus cacti*) is most abundant, as is also the mollusk called *Aplisia depilans*, used by the Indians as a dye substance. This is said to be the same dye known to the ancients as *lepus marinus*, from which they extracted the purple of Tyre, in Asia Minor. The flora is equally rich, comprising over 70 classes of cabinet woods, 50 different kinds of timber, 40 varieties of fruits, 30 textile plants, 22 tanning plants, roots, leaves, and barks, 25 oleaginous plants, 36 dyewoods, 15 forage and 15 poisonous plants, 30 gums and resins, and many varieties of medicinal plants and ornamental flowers.

Resources.—The main industries of the State are agriculture and commerce, which occupy the first rank; forest exploitation, stock raising, and the development of the salt deposits of the coast. Among the principal cultivated products are coffee, cacao, tobacco, sugar cane, and indigo. Mexican official statistics for 1902 give the following figures in regard to the production of these articles for the period to which reference is made:

	Kilograms.	Value.
Cacao	1,551,705	$1,143,182
Coffee	4,330,818	1,143,228
Tobacco	283,670	44,232
Sugar cane and products	48,031,630	1,885,553
Indigo	57,250	108,963

Romero, in his report on Coffee Culture on the Southern Coast of Chiapas,[a] estimated that a coffee plantation in Soconusco would yield in the fifth year, and every year thereafter, a profit of 135.49 per cent on the capital invested during the four first years. Cacao yields four crops a year in the State, the principal crop being in May and the other three in August, November, and February. It also grows wild at the highest altitudes, where it is known under the name of "wild cacao." It is stated that the Soconusco cacao is the best variety obtainable.

The tobacco of Mapaztepel and Simojovel is, according to experts, as good as the product from Tuxla (Veracruz) and Huimanguillo (Tabasco). The indigo from the department of Tonalá is very fine, and is sent abroad almost in its entirety.

The climate and soil are adapted to the cultivation of fruits of all

[a] Coffee and Rubber Culture in Mexico.—New York, 1898.

kinds, the mulberry tree and the vine. Rubber grows wild throughout the State. Stock raising, although immense facilities are afforded by nature, has not been developed to the extent it deserves. There are, however, herds of cattle of all kinds, and the department of Tuxla Gutierrez is noted for the manufacture of round cheeses equal if not superior to the Edam or Holland cheese.

Mining.—The mining wealth of Chiapas has neither been properly explored nor exploited; the most trustworthy data, however, show that gold and copper are found in certain places in the Sierra Madre Range; iron, lead, talcum, and coal in the valley of San Cristobal, and asphalt, sulphur, sulphate of sodium, gypsum, alabaster, nitrate of soda, salt, yellow amber, etc., in various sections. The salt deposits of Tonalá, Cuztepeques, and Soconusco yield an abundant supply of that mineral, many persons being engaged in developing this source of wealth. It is said that the Sierra Madre range also contains silver, lead, and iron mines. The mining production of the State in 1902 is officially valued at $340,000.

Trade.—Chiapas exports to other States of the Republic, to Guatemala, the United States, and Europe. The value of its trade with Guatemala and the States of Tabasco and Oaxaca may be estimated at about $2,000,000 annually, of which about $800,000 is credited to imports and the rest to exports. To Guatemala is sent cattle of all kinds; to Oaxaca, coffee, tobacco, etc.; to México City, cacao, cheese, and tobacco; to San Francisco, Cal., coffee, indigo, woods, and fruits; to Europe, indigo and minerals. The imports of the State are cotton, woolen, silk, and linen goods, wines and liquors, arms and ammunition, petroleum, canned goods, sewing machines, machinery and agricultural implements, dyes and medicinal products, paper, books, etc. The principal custom-houses are situated at Soconusco and Tonalá.

Communications.—Three concessions have been granted for the construction of railways through the State: One from San Juan Bautista to El Paso de Tamulté, another from the port of San Benito to Tapachula, and another from the port of Tonalá to Frontera (Tabasco), passing through Tuxla Gutierrez. There are telegraph and telephone lines, an efficient mail service, and fine wagon roads throughout the State.

Industries.—The principal manufacturing industries are: The manufacture of the products of sugar cane, such as rum, sugar, molasses, etc.; cheese, hats, mats, cotton and woolen fabrics, cigars, soaps, candles, and the tanning of hides.

Divisions.—The State is divided politically into 11 departments and 101 municipalities. The departments are:

Pichucalco, population, 26,171; chief town, Pichucalco, 114 kilometers southwest of San Juan Bautista and 357 kilometers southwest of Frontera (Tabasco).

Simojovel, population, 25,562; chief town, Simojovel, 1,076 kilometers east-southeast of México City, 84 kilometers northwest of San Cristobal, and 172 kilometers southeast of San Juan Bautista.

Palenque, population, 16,808; chief town, Catazajá, 126 and 124 kilometers northwest and northeast of Frontera (Tabasco) and Carmen or Laguna (Campeche); another important town in the department is Palenque, 230 kilometers from San Cristobal and 316 kilometers from Tuxla, its neighborhood being celebrated for the Palenque ruins, which contain remnants of the Maya civilization.

Chilón, population, 35,434; chief town, Ocosingo, 100 kilometers northeast of San Cristobal and 188 kilometers northeast of Tuxla Gutierrez.

Comitán, population, 43,876; chief town, Comitán, 1,337 kilometers from México City, 84 kilometers from San Cristobal, 88 kilometers from Tuxla, and 19 kilometers from the frontier custom-house of Zapatula; is on the Rio Blanco, and the commercial center of the State.

Soconusco, population, 36,641; chief town, Tapachula, on the Coatán, 1,250 kilometers from México City, 130 kilometers from Quezaltenango (Guatemala); another important town being the port of Soconusco or San Benito, 35 kilometers southwest of Tapachula, the principal traffic of which is carried on with Guatemala, Panamá, and San Francisco, Cal.

Tonalá, population, 12,258; chief town, Tonalá, one of the best ports on the Pacific coast, 200 kilometers from Tuxla Gutierrez and 370 kilometers from San Cristobal (it being the natural port for these two cities), 998 kilometers from México City, 508 kilometers from Oaxaca, and 139 kilometers from Tehuantepec. The railway from Tonalá to Tuxla Gutierrez, San Cristobal, and Frontera starts from this point. The city also has a maritime custom-house and a number of foreign business houses, mainly American and German. It carries on an active trade with San Francisco, Cal., and the ports of Central America. This trade is valued at over $300,000 annually, of which $200,000 is credited to exports and the remainder to imports. The Pacific Mail connects the port with other Pacific ports.

Tuxla Gutierrez, population 22,558; chief town, Tuxla Gutierrez. This town is the capital of the State, with 10,982 inhabitants, and lies 5 kilometers from the river Sabinas, 220 kilometers from the port of Tonalá on the Pacific, 170 kilometers from San Cristobal, 344 kilometers from San Juan Bautista, 487 kilometers from Frontera (Tabasco), and 1,115 kilometers from México City. Its climate is temperate and healthy. It is an important commercial and manufacturing center, to be connected with both the Gulf and the Pacific coasts by the Tonalá and Frontera Railway. The principal buildings are the Government Palace, the theater, the high school, and the hospital. Its main industries are tanning, the preparation of indigo, the manufacture of round cheeses, and commerce.

Mezcalapa or Progreso, population 12,635, whose chief town, Copainalá, is 84 kilometers from Tuxla Gutierrez.

Chiapa, population 19,014, the chief town, Chiapa de Corzo, being situated 12 kilometers from Tuxla Gutierrez, 85 kilometers from San Cristobal, 232 kilometers from the port of Tonalá, and 1,127 kilometers from México City.

Libertad, population 18,245; its chief town is San Bartolomé de los Llanos, situated in a fertile plain 70 kilometers from the capital of the State and 310 from the port of Tonalá.

San Cristobal or El Centro, population 31,783, whose principal town, San Cristobal de las Casas, was until 1892 the capital of the State, and consequently is one of the most important towns in the department. Among its buildings are the Cathedral, the old and new Government palaces, the Institute of Arts and Sciences, the Episcopal Palace, the Seminary, the theater, the hospital, and the Public Library, which contains upward of 4,000 volumes. The city is 1,203 kilometers distant from the capital of the Republic, 86 kilometers from the State capital, 370 kilometers from Tonalá, 850 kilometers from Veracruz by land, 538 kilometers from San José (Guatemala), 736 kilometers from Mérida (Yucatán), and 746 kilometers from Oaxaca. Agriculture, stock raising, and manual industries are the principal sources of wealth of the city and department.

CHIHUAHUA.

The State of Chihuahua, whose capital is the city of the same name, at an altitude of 1,516 meters, has a population of 327,784 persons, 8,000 of whom are Indians belonging principally to the Tarahumara race. It is not only the largest of the 27 States of the Republic, but is also one of the richest in natural resources. Its area is 233,094 square kilometers, or about three times that of the State of New York. This vast area is but sparsely populated, containing only 1.15 inhabitants to the square kilometer, while the State of Pennsylvania, about one-third its size, has 140.1 inhabitants to the square mile.

Boundaries.—Its northern boundary is formed by the Rio Grande River, which separates the State from the United States. It is bounded on the east by Coahuila, on the south by Durango, and on the west by Sinaloa and Sonora.

Situation.—The State is situated on an undulating table-land, the elevation of which varies from 3,500 to 7,000 feet above the level of the sea. Mountain peaks abound in the Sierra Madre range, which traverses the State. Some of the principal peaks, situated in that part of the range known as Sierra de Tarahumares, with their elevations above sea level, are Jesús y Maria, 2,511 feet; Mesa de Tabascotes, 2,359 feet, and Bufa de Cerro Prieto, 2,811 feet. Among the plains of greater area lying between the mountain peaks and ranges are the Chilicote, the Gigantes, and Bolsón de Mapimí.

Climate.—The climate of the entire State is salubrious and healthful. The summers are long, and for a few months considerable heat is felt in the lower elevations during the middle of the day, but the nights are always cool and pleasant. During the short winters, especially in the elevated portions of the table-lands, frosts frequently occur, and sometimes snow falls. Considerable rain falls during the summer, but in winter the precipitation is very light.

Resources.—Notwithstanding large portions of this State are already under cultivation, there are still hundreds of thousands of acres of good land that could be utilized by irrigation and rendered exceedingly productive. Its mountains, rich in ores and mineral wealth, offer an inviting field to the capitalist, prospector, and miner. In a word, capital and labor will find in the rich and progressive State of Chihuahua unbounded opportunities for profitable investment and employment. Coal exists in various localities, but most of the mines, lacking good transportation facilities, have been but little developed.

Agriculture.—Chihuahua produces corn, wheat, rye, oats, potatoes, beans, vegetables, and most of the fruits of the temperate zone. Cotton is grown along the borders of some of the lower rivers with great success. Latest available official statistics for 1901 give the following figures for the principal agricultural products of the State: Cereals, $3,506,488, of which over $1,500,000 is represented by wheat to the quantity of 20,000,000 kilos; maguey products, $180,000, and textile fibers, $20.000. The principal source of industry, however, is the raising of cattle, sheep, horses, and mules. *Haciendas* of several hundred square miles, producing as many as 20,000 head of cattle, horses, etc., are common. It is estimated that on some of the large ranches there are branded from 30,000 to 40,000 calves yearly. Besides mesquite and similar trees, which grow everywhere, cedar is found in the Sierra Madre, while in some parts of the State vast forests of oak and pine cover the mountain slopes. There are several Mormon colonies in Chihuahua, all of which are in a flourishing condition. These colonies are rapidly becoming an important factor in the agricultural development of the country.

Mining.—The mineral riches of Chihuahua are probably not surpassed by any other State of the Republic. Millions of dollars' worth of gold, silver, copper, and lead ores are mined annually, and the output is constantly increasing. Large quantities of these ores are treated in the smelting and reduction works of the State and elsewhere in the Republic. The number of mining claims registered during the year ending December 31, 1901, is officially given at 2,019 claims, covering an extension of 19,759 hectares. For the year ending December 31, 1902, the number of claims registered was 2,550, covering an area of 27,773 hectares. The extension of the Rio Grande, Sierre Madre and Pacific Railway and the completion of the Chihuahua and Pacific Railway, now in course of construction, together with the utilizing of

newly discovered reduction processes in the treating of ores, will be of great force in the development of the State. Among the numerous known mining districts, all noted for their abundant production of ores, the most noteworthy are Santa Eulalia, Parral, Minas, Nuevas, Palmarejo, Uruapan, Guazapares, Cusihuiriachic, Batopilas, Cerro Colorado, Corralitos, etc. The official estimate of the mining production of the State for 1902 gives the following data: Number of mines in operation, 62; total production, 160,293,277 kilograms, valued at $13,617,315. The mines in operation were of gold, silver, copper, lead, and iron.

Trade.—Lying directly south of the United States, the State of Chihuahua is exceedingly well situated for the carrying on of international trade. Cattle, sheep, and hogs are exported annually in considerable numbers to the United States. Though this industry is as yet in its infancy, under proper conditions and encouragement it could be increased and developed to immense proportions.

Communications.—The main line of the Mexican Central Railway extends for a distance of 850 kilometers through the State. A branch line of this road also traverses the important mining district of Parral. The Mexican Northern Railway runs from Escalón to Sierra Mojada, State of Coahuila, connecting that region, rich in low-grade lead ores, with the Mexican Central system. The Rio Grande, Sierra Madre and Pacific Railway and the Chihuahua and Pacific Railway are now being constructed, and will unite the capital of the State with rich mining and agricultural sections hitherto difficult of access. Good wagon roads abound and connect the different districts with Chihuahua, the capital.

Divisions.—The State is divided into ten districts, the names, principal towns, and population of which are as follows:

District.	Principal town.	Population of district.
Andres del Rio	Batopilas	27,996
Arteaga	Chinipas	9,417
Bravos	Ciudad Juarez	12,233
Camargo	Santa Rosalia	27,795
Guerrero	Ciudad Guerrero	25,828
Hidalgo	Hidalgo del Parral	48,744
Iturbide	Chihuahua (capital of the State)	104,232
Jimenez	Jimenez de los Santos	24,543
Mina	Guadalupe y Calvo	12,717
Rayon	Ocampo	16,761
Total		327,784

The following are some of the most important towns of the State:

Towns.	Number of inhabitants.	Towns.	Number of inhabitants.
Chihuahua (capital)	30,405	Ciudad Jimenez	9,318
Hidalgo del Parral	14,748	Rosales	8,500
Ciudad Juarez	8,218	Allende	8,200

The city of Chihuahua is the metropolis and business center of the entire northwestern section of the Republic, and does a larger business than other Mexican towns of five times its size. Not only does it supply the outfits for the majority of the mining camps and prospecting expeditions of the State, but it contains a number of banks and commercial houses engaged in all branches of business. It also has large manufacturing establishments. The Compañia Industrial Mexicana is one of the largest iron foundries and machine factories in the Republic. The Chihuahua Brewery, one of the best constructed breweries of the country, has a capital of nearly 500,000 *pesos*. The woolen factories, Concordia, La Paz, and Rio Florido, produce fine cassimeres, blankets, carpets, cotton goods, etc. Besides these and the Compañia Minera, there are a number of other establishments which are favorably known throughout the Republic. A Federal assay office is situated at Chihuahua, which, according to official figures, during the year 1900–1901 assayed silver and gold to the value of $2,520,995 for coining purposes and $1,564,098 for export, while the figures for 1901–2 are $2,795,408 and $1,802,640, respectively.

COAHUILA.

The State of Coahuila, population 296,938—whose capital is Saltillo, 1,627 meters above the sea, population 23,996—is one of the largest, richest, and most fertile regions in the Republic; being also the third largest State. At is northern boundary it connects with the United States, and although its population is at present numerically small it is steadily increasing, owing to the great undeveloped wealth of its territory, which is traversed by five great railroad lines—the International, the Central, the Gulf Line, the National Mexican, and the Northern Mexican.

Boundaries.—The boundaries of the State are: On the north, the United States of America, from which it is separated by the Rio Bravo; on the east, the State of Nuevo Leon; on the south, San Luis Potosí and Zacatecas; on the southwest and west, Durango; and on the northwest and west, the State of Chihuahua. Its superficial area, according to the latest available official publication, "Anuario Estadístico, 1902," is 165,099 kilometers.

Situation.—The State, which is very irregular in outline, occupies a territory which, in the north, is a flat table-land, crossed by small ranges of mountains and hills, becoming more broken toward the south. The numerous branches of the Sierra Madre, in the southern and central portions, are very rich in minerals and form the beautiful valleys of Parras, Sobaco, Catarina, San Isidro, San Marcos, Alamo, Santa Rosa, and Hundido. The northern ranges are covered with *zacate*, certain species of the agave plant, and cacti. In the plains extending from the foot of these mountains northward the heat is intense, owing

to low altitude and the scarcity of rain. These plains form a desert where the rich coal deposits of the State are found. To the southeast lies the beautiful and rich agricultural region known as the Laguna, said to contain the most fertile soil in the world. The valley of Parras, the foremost viticultural section, is situated in the eastern part of the State. The mountainous region is rich in gold, silver, iron, copper, lead, and other mineral products. The altitude varies from 700 to 5,800 feet above sea level, and with respect to temperature is divided into the hot lands, embracing the northern portions; the temperate region, which includes the southern portions and the valleys; and the cold region, which is the mountainous section.

Climate.—The climate is not healthy, the most common diseases being malarial fevers, typhus, rheumatism, and affections of the respiratory and digestive organs. Winds are very variable and rains abundant in the districts of Saltillo, Viesca, and Rio Grande; moderate in Parras, and scarce in Monclova and the lowlands. Frost is occasional in the southern portion of the State and very frequent in the Rio Grande section.

Topography.—The principal mountain ranges are in the districts of Rio Grande and Monclova. There are also the Sierra del Carmen or Las Cruces, on the boundary line of the two districts named; the Sierra Madre, in the Saltillo district; the Sierra Paila, in Parras; and Sierra Noas, in Viesca, besides numerous ramifications of the original systems, and small ranges and hills running in all directions. The different ranges run in almost parallel lines, and so close together that their slopes form a number of canyons, of which the principal are San Marcos, Santa Rosa, and El Rosario in the south, and Los Árboles and San Rodrigo in the north.

Hydrography.—Owing to the vast area of the State of Coahuila and the paucity of rivers irrigating it, the entire extent has been considered as a sterile country. This is true in a general way, as in many places only natural deposits of rain waters are found; but on the other hand, there are extremely fertile sections, such as the "lagunas," thoroughly irrigated by the Nazas and Aguanaval rivers. The principal water courses are the Rio Bravo, or Rio Grande, forming the boundary line with Texas, which rises in the State of Colorado (United States), enters Mexican territory near Ciudad Juarez, or Paso del Norte, and after traversing a course of over 800 kilometers and receiving many tributaries, finally empties into the Gulf of México. Next in importance is the Sabinas, forming the eastern boundary between the districts of Monclova and Rio Grande, which rises in Sierra del Carmen and passing through San Juan de Salinas and Juarez enters the State of Nuevo Leon opposite the frontier custom-house of Guerrero, where it forms the Rio Salado, an affluent of the Rio Bravo. Other rivers are the Alamos, Monclova, Patos, Saltillo, Aguanaval,

and Nazas, besides their tributaries and a great number of smaller streams. The principal lagoons are the Alamo, or Parras, in the district of Viesca; the Mayán, or Muerta, larger than the former, in the Parras district; the Agua Verde and the Santa María, in the district of Monclova.

Fauna and flora.—The fauna of the State has not been thoroughly studied on account of the great extent of territory and the scarcity of the population, but there are over 40 species of mammals, 70 birds, 16 reptiles, 5 batrachians, 4 fishes, numerous insects, etc. The flora comprises over 60 varieties of trees indigenous to the cold and temperate regions and 50 belonging to the hot lands. The principal fruits number upward of 40 varieties, notably grapes, both white and purple, suitable for the manufacture of wines, alcohol, and raisins; the Parras district is especially famous for their production. Other fruits are pears, apples, peaches, etc. The number of textile plants is estimated at 15; tanning plants, 13; oleaginous seeds, 10; plants for dyeing purposes, 10; forage plants, 13; poisonous plants, 17; gums and resins, 12; medicinal plants, 70, and over 100 varieties of ornamental plants and flowers.

Agriculture.—Agriculture is the principal industry of the State; cotton, corn, wheat, beans, pease, sugar cane, linseed, and about 30 species of leguminous plants being the most common products. Grape culture is attaining greater importance daily, and it is claimed that the product of the district of Parras is sweeter and more delicious than that of California, and equal, if not superior, to the Málaga and Granada varieties. Official statistics for 1902 estimate the amount of grape alcohol produced by the State at 1,883 hectoliters, valued at $75,320, and 7,183 hectoliters of wine, valued at $192,660; grapes, 1,444,730 kilos, valued at $64,496; cotton, 14,073,750 kilos, at $6,666,277; ixtle over 5,250,000 kilos, at $800,000; corn to the value of over $2,000,000, and wheat about $1,500,000. Almost all the plantations in Coahuila are equipped with modern machinery and implements and follow the most advanced systems of cultivation. One of the greatest sources of wealth is cattle raising, the plains affording excellent pasturage for the stock. Efforts have been made to improve the breeds by crossing the native cattle with fine imported specimens. Several foreign companies have bought lands for cattle breeding.

Mining.—The mineral wealth of the State remained unrecognized until a few years ago, but its development has since been so steady and rapid that now mining may be said to constitute one of the chief industries. The wealth of Sierra Mojada, Sierra del Carmen, and the valley of Santa Rosa is almost incredible. These mineral regions are in reality immense silver deposits, which, in conjunction with the coal fields of Piedras Negras and Salina Valley, and the agricultural products of the "Laguna," form the foundations of the future wealth of

the State. The registered number of mines in Coahuila on the 31st of December, 1902, according to Mexican official figures, amounted to 551, covering an area of 11,240 hectares, the principal minerals being silver, lead, coal, copper, iron, and gold. The production of these mines in 1902 is officially given at 535,000,000 kilos, valued at $4,236,000.

Trade.—Coahuila is one of the most prosperous commercial sections of the Republic, due, mainly, to its railroad system, which affords the necessary facilities for the transportation of the State products, such as cotton, live stock, minerals, wines, etc. The export trade is principally with the United States, the metallic products being forwarded over the Mexican Northern Railway from Sierra Mojada to Escalón, thence on the Mexican Central to Ciudad Juarez. Some coal is exported to the United States through Piedras Negras, the remainder being consumed in the country by such railways as use this fuel. Flour is sent to Nuevo Leon, cotton fabrics to the States of Zacatecas, Jalisco, Durango, México, and Monterey; salt, live stock, wool, and skins to several Mexican States and to Texas; raw cotton, table grapes, cereals, etc., to several neighboring States, and ixtle and its various manufactures to the United States. The commerce of the State is in the hands of Americans, Spaniards, Germans, and Frenchmen. The leading markets are Ciudad Porfirio Díaz or Piedras Negras, a customs port on the American frontier; Saltillo, San Pedro de la Laguna or Colonia, Torreón, Sierra Mojada, Monclova, Parras, and Viesca. According to the "Boletín de Estadística Fiscal," the value of the trade through the city of Porfirio Díaz during the fiscal year 1901–2 amounted to $4,810,637 for imports and $5,677,603 for exports. During the first 6 months of the fiscal year 1902–3, according to the same authority, the imports and exports through said city were $2,745,976 and $3,004,404, respectively. The total trade of the State can be estimated from $11,000,000 to $12,000,000 silver per annum.

Communications.—The railway system of the State is probably the best in the Republic. It is traversed by five different lines, as follows: The Mexican International, from Ciudad Porfirio Díaz, on the banks of the Rio Bravo del Norte, opposite Eagle Pass (Texas), to the city of Durango, capital of the State of the same name, a distance of 869.51 kilometers. Its main tracks are within the territory of Coahuila as far as Torreón, or a length of 616.55 kilometers. This railway system has several branches open to traffic, and others either in process of construction or under survey, namely, from Sabinas to Honda, 19.81 kilometers; from Monclova to Cuatro Cienegas, 67.15 kilometers; from Hornos to San Pedro, 23.37 kilometers; and from Pedriceña to Velardeña, 9.35 kilometers, this last in the territory of Durango.

The Mexican Central, which crosses the southeastern section of the State in the districts of Viesca and Parras, running in the former district over the tracks of the International from México to Ciudad

Juarez and in Parras over its own tracks from Lerdo to San Pedro de la Colonia (La Laguna line). There are several stations, the line in its course through the State measuring 178 kilometers from San Isidro to Torreón or Nazas. At the latter place the Central connects with the International Railway. From Lerdo (Durango) starts the branch known as the "La Laguna" line, whose terminal station is San Pedro de la Colonia, the distance between the two points being 63.4 kilometers. The tracks leave the territory of Coahuila after passing the station of Jalisco, and after traversing a section of Durango return to Coahuila beyond the Cañón de Picardías.

The Northern Mexican is essentially for the mining district, and covers a distance of 125 kilometers from Escalón (Chihuahua) to Sierra Mojada.

The Monterey and Gulf Railway runs from Monterey to Treviño or Venadito, a distance of 106 kilometers.

The National Mexican runs from Ventura to La Mariposa, 152 kilometers, passing through Saltillo. In addition there is a line projected to run direct from Monterey (Nuevo Leon) to the city of Porfirio Díaz, and another line is being constructed from Saltillo to Concepción del Oro.

Besides the railroads there are excellent wagon roads as follows: From México City to Saltillo, 925.64 kilometers; Saltillo to Monterey, 105 kilometers; to Zacatecas, 480 kilometers; to Durango, 507 kilometers; to Chihuahua, 909 kilometers; to Zaragoza or Rio Grande and the shores of the Rio Bravo, 500 kilometers; to San Antonio, Tex., 864 kilometers, and from Zaragoza to Sancti Spiritus, Tex., 1,032 kilometers.

The telegraphic network of the State covers an area of about 2,000 kilometers, while telephone lines extend over more than 100 kilometers. The mail service is very efficient.

Industries.—The principal manufacturing industry is the manufacture of cotton and knitted goods, there being in the State on December 31, 1901, 51,648 spindles and 1,715 looms, the quantity of cotton consumed during the year amounting to 2,082,130 kilograms, the output being estimated at 549,373 pieces of printed goods and 60,000 kilograms twine. Other manufacturing industries are wines, tanned skins and hides, soap, candles, cheese, shoes, molasses, furniture, pottery, carriages, wagons, and chocolate.

Divisions.—The State of Coahuila is divided into 5 districts, subdivided into 33 municipalities. The districts are as follows:

Monclova, population 75,433; chief town Monclova, on the river of the same name, is situated in the midst of fertile farm lands, on the line of the International Railroad, 238 kilometers southwest of Ciudad Porfirio Díaz, 370 kilometers from Torreón, 1,514 from México City by rail, and 170 kilometers distant from Saltillo. The other leading

towns in the district are Muzquis, Cuatro Ciéngas, Sierra Mojada—an important mining town, 420 kilometers from Saltillo, and one of the terminal stations of the Northern Railway, whose exports of lead and iron ores to the United States are estimated at about $300,000 per annum—and Candela or Romero Rubio. The International and Northern Mexican railways traverse the district, the former running in a southeasterly direction and the latter toward the southwest.

Rio Grande, population 46,851; its chief town, Ciudad Porfirio Díaz (formerly Piedras Negras), 7,888 inhabitants, is situated 1,752 kilometers from México City, 480 kilometers from Saltillo, and 65 kilometers from Zaragoza. This district is on the boundary line between México and the State of Texas, and its capital lies directly opposite Eagle Pass, with which it is connected by the great "international bridge" across the Rio Bravo, belonging to the International Railway. It is an iron structure, 539.90 meters in length. The city has five public buildings and is an important customs port. Among the other cities of the district are Zaragoza, on the Rio Grande, 65 kilometers from Porfirio Díaz and 44 kilometers north of Saltillo; Guerrero, 562 kilometers from Saltillo and 52 kilometers from Porfirio Díaz; Morelos, Allende, and Nova.

Saltillo, or El Centro, population 73,157; chief town Saltillo, or Leona Vicario, 23,996 inhabitants (also the capital of the State), 865 kilometers from México City by the wagon road and 974 by rail, and 479 kilometers from Ciudad Porfirio Díaz, on the International Railway. It is one of the stations of the Mexican National Railroad and is the principal industrial and commercial center of the State. The principal buildings are the government palace, the Zaragoza theater, the municipal palace, the Catholic Cathedral, the penitentiary, the hospital, the American consulate, and several others. The State college, called "Atenéo Fuente," has a good museum of natural history, also a small but very fine public library. Saltillo is noted for the manufacture of *zarapes* (shawls), made of wool, and remarkable not only for the fastness of their colors, but also for tasteful combination, artistic design, and fineness of fabric, some of them being worth as much as $200 to $300. Other industries are the manufacture of cotton cloth, knitted goods, and flour. There are several flour mills in the town and cotton mills run by water power. Other leading towns are Ramos Arizpe, 15 kilometers from Saltillo, on the Mexican National Railway, Artega, and Patos.

Parras, population 53,672; its principal town, Parras de la Fuente, is situated 126 kilometers from Saltillo and 25 kilometers from the station of Pailas, on the International Railway, with which it is connected by a stage line. This town is located in a very fertile valley, noted for its fruit production, particularly grapes. There are cotton and flour mills and a factory devoted to the preparation of grape wine

and grape rum. San Pedro de la Colonia is the second town in the district, situated 250 kilometers from Saltillo and 16 kilometers from the railway. In the town are several cotton-seed oil mills, cotton gins, and a large factory for the production of white cotton cloths, colored drills, toweling, etc. The Mexican International Railway traverses the district, stopping at seven stations.

Viesca, population 47,825; chief town Viesca, situated 224 kilometers from Saltillo, 24 kilometers from Hornos, a station on the International Railway, with which it is connected by a stage line, and 73 kilometers from Torreón station. Other leading towns are Matamoros Laguna, 28 kilometers from Torreón station, and Torreón, an important railway station of the Central and the International lines, 1,136 kilometers from México City, 616.55 kilometers from Porfirio Díaz, and 272 kilometers from Saltillo. This town contains a cotton mill and a soap factory. This district is essentially a mining region, and is well supplied with railway facilities, the Mexican Central traversing it from south to northwest, a distance of 178 kilometers, and the International covering an extent of 53.29 kilometers from west to east. The former line has 9 stations and the latter 4.

COLIMA.

The State of Colima, population 65,115, capital Colima, 504 meters altitude, population 20,698 is, with the exception of Tlaxcala, the smallest and least populous of the Mexican States. It is situated in a beautiful tropical region, with a good coast line on the Pacific.

Boundaries.—The boundaries are the State of Jalisco on the north, northeast, and west; the State of Michoacán on the east, and the Pacific Ocean on the south. Its area is estimated at 6,114 square kilometers, divided as follows: Mainland, 5,928 square kilometers, and the islands of Revillagigedo, 186 square kilometers.

Climate.—The climate is hot and unhealthy except in the north, where the snow-crowned peak of the Colima modifies the temperature. Rainfall is abundant, and the winds in general are from the northeast. Malarial fevers are prevalent in almost all sections.

Topography.—The northern section of the State, occupied by the slopes of the Colima volcano, constitutes the mountainous part of its territory, the ascent from the coast rising gradually to a height of 1,200 meters. The litoral is washed by the Pacific for an extent of 160 kilometers. It is low and sandy and contains rich salt deposits. The Revillagigedo group, composed of four desert islands of volcanic origin, named Socorro, San Benedicto, Rosa Partida, and Clarión, lies 240 kilometers northwest of Manzanillo.

Hydrography.—The irrigating streams are the Armería and Coahuayana rivers and their affluents. The former traverses the center of the State from north to south, emptying into the Pacific through the

mouth of the Pascuales after a course of 294 kilometers, its navigable extent only reaching 18 or 20 kilometers from the mouth. The Coahuayana forms the natural boundary line between the States of Michoacán and Colima. In addition to the water courses above mentioned there are the lakes of Cuyútlán and Alcuzagüe.

Fauna and flora.—The fauna of the State, although rich and varied, is little known. There are about 50 species of mammals, over 100 birds, 32 reptiles, 7 batrachians, 50 fishes, and numberless insects of all kinds, besides corals and sponges and 12 species of mollusks. The flora embraces over 170 species of trees, 60 fruits, 25 textiles, 20 tanning plants, 12 oleaginous seeds, 23 dye plants, about 20 forage plants, 9 poisonous plants, 40 aromatic, 100 medicinal, 22 gums and resins, and a great number of ornamental shrubs and flowers.

Resources.—The principal industries are agriculture, stock raising, and the exploitation of the salt deposits. The fertility of the soil, due to its fine natural irrigation, permits the culture of various products, among others coffee, cacao, tobacco, rice, cotton, indigo, sugar cane, cereals, and leguminous plants. The coffee of Colima is regarded in Germany as the best on the market. Official figures, from Mexican sources, estimate its production in 1902 at 160,850 kilos, valued at $81,257. In the same year cacao was quoted at 2,000 kilos, at $2,000; tobacco, 126,715 kilos, at $14,553; indigo, 3,442 kilos, at $7,426, and cotton, 197,800 kilos, at $25,625. For the development of its agricultural wealth the State is greatly in need of colonists. The mineral wealth lies principally in the salt deposits, which extend all along the coast. There are also mines of silver, gold, copper, and sulphur.

Trade.—Colima carries on an active trade with the towns south of Jalisco, with Guadalajara, Mazatlán, and other Mexican ports, and with the foreign ports of San Francisco and San Diego (California), also with Germany and the Hawaiian Islands. The maritime trade is conducted through the port of Manzanillo, and consists chiefly of exports of rice, coffee, rubber, fruits, cabinet woods, dyewoods, corn, hides and skins, minerals, etc., the imports being woolen, linen, and silk goods, alimentary products, glassware, arms and ammunition, wines and liquors, etc. Overland traffic is carried on by rail from Manzanillo to Colima and to Villa Alvarez; in other instances, by wagon roads. The total travel of the State is estimated at a value of about $2,000,000 per annum.

Communications.—The railway of the Compañía Constructora Nacional Mexicana (Mexican National Railway) crosses the State over the tracks of the International Line from Colima to Manzanillo, a distance of 95 kilometers. A branch from Colima to Guadalajara is in process of construction. Another railroad runs from Colima to Villa Alvarez, 6,000 meters in length, and a tramway 1,100 meters long connects Colima with the railroad stations. Telegraph and telephone

service are excellent, and the mail service is very efficient. The "Pacific Mail," the "Red Line," the "Izaguirre," and the Sinaloa and Durango Railroad Company's steamers connect the port of Manzanillo with foreign and domestic ports, while good wagon roads run from Colima to México City and the principal towns of the adjacent States.

Divisions.—Colima is divided into 3 partidos, subdivided into 7 municipalities, as follows: Partido del Centro, Partido de Villa Alvarez, and Partido de Medellín.

The Partido del Centro, population 41,763, embraces the municipalities of Colima, Coquimatlán, and Ixtlahuacán. The principal town of the municipality of Colima bears the same name, and is the capital of the State. According to the last census the population of the capital was 20,698 inhabitants. It is situated in a beautiful and fertile valley, 504 meters above the sea level, which is irrigated by the Colima River, and is one of the handsomest towns on the Pacific coast. The principal buildings are the city hall, the theater, the cathedral, a new market house, and the station of the Mexican National Railroad. It is the commercial center of the State, being distant about 915 kilometers from the capital of the Republic, and possesses a street-car line and an electric-lighting system.

Coquimatlán is the chief town of the municipality of the same name, distant about 12 kilometers from Colima, on the Mexican National Railway.

Ixtlahuacán is the principal town of the municipality of that name, and is about 142 kilometers from Colima.

The Partido de Villa Alvarez or Almoloyán, population 16,400, embraces a municipality of the same name and that of Comalá. Almoloyán, or Villa Alvarez, is the capital of the former, and is 4 kilometers from Colima, with which it is connected by a railway 6 kilometers in length. The chief town of Comalá bears the same name as the municipality, and is 12 kilometers from Colima and 10 from Villa Alvarez.

The Partido de Medellín, population 6,996, comprises the municipalities of Manzanillo and Tecomán, their chief towns bearing the same names. Tecomán is situated 45 kilometers from Colima, on the Mexican National Railroad. Manzanillo is one of the leading towns of the State, and is situated 861 kilometers from México City, 122 kilometers from Colima, and 374 kilometers from Guadalajara. It has a large, sheltered harbor, the town being built on the isthmus which separates the waters of the port from those of Cuyutlán. It is connected with the capital by the Mexican National Railway, a distance of 94.5 kilometers. The foreign trade of the port is estimated at about $450,000, divided equally between imports and exports. The Pacific Mail Steamship Company connects it with San Francisco (California) and Panama (Colombia), and the steamers of the "Red" Line, Izaguirre & Co., and of the Sinaloa and Durango Railroad Company transport merchandise

between Manzanillo and the home ports. The custom-house of the State is located at Manzanillo.

DURANGO.

The State of Durango, population 370,294, with a capital city 2,100 meters altitude, bearing the same name, is one of the largest and richest States in the Republic. It is situated north of the torrid zone, on the slopes of the Sierra Madre Mountains.

Boundaries.—Its boundaries are Chihuahua on the north, Coahuila on the east and southeast, Zacatecas and the Territory of Tepic on the south, and Sinaloa on the west. The area, according to the "Anuario Estadístico de la República Mexicana," 1902, covers 109,495 square kilometers.

Climate.—The climatic conditions of the State vary with the respective altitudes of the localities. The western portions, traversed by the Sierra Madre Mountains, are cold; the region of the valleys and plains, extending from the base of the mountains, is temperate, and in some places rather warm, while the Nazas basin is temperate; the pasture lands are exposed to great variations, being extremely cold in winter and very hot in summer. Rainfall is moderate, and frosts are frequent in the mountains. The most common ailments are fevers and affections of the respiratory and digestive organs.

Topography.—Owing to the topographical conditions, the products of the hot, temperate, and cold zones can be cultivated. The western and southern portions are mountainous, being traversed by the Sierra Madre Mountains. The mean altitude varies from 2,500 to 3,500 meters, the highest point being the peak of Muinoxa. The crest of the Sierra Madre is formed by the convergence of several high mountain ranges which rise in the western part of the State, the principal being Copolquina, Topia, Cavelas, Amacuti, Tominil, Muinora, Guanaccoi, and San Juan de Camarones. These mountains are all rich in minerals, mainly gold, silver, and lead. Other mountains are the Mesquital, Oso, Indé, Candela, San Francisco, Cuencamé, and Noas. The principal isolated peaks are Cerro del Mercado, an inexhaustible iron deposit north of the city of Durango; Cerro del Fraile, an extinct volcano; Pichihuantepec, and Pánuco de Avino, which contains an immense silver deposit. The Sierra Madre Mountains are rich in minerals, while the valleys in the eastern section are well irrigated and fertile.

Hydrography.—The most important river is the Nazas, in the northern part of the State. It rises on the eastern slope of the Sierra Madre and empties into Habas Lake, after a course of 600 kilometers. Its principal affluents are the Santiago and San Juan rivers, the former traversing an extent of 215 kilometers before its junction with the main stream. The Tunal River rises west of the city of Durango,

and after a course of 150 kilometers enters the Territory of Tepic. The Suchil, or Nombre de Dios, an affluent of the Tunal; the Rio Chico, or Alaponeta, and the Aguanaval are the other most important streams. There are also some small lakes, the principal being Colorado, Guatimapé, Ojo de Agua, Sanceda, Indé, Cuencamé, and Atotonilco. Near the city of Durango there is a fine mineral spring, holding in solution a large quantity of iron.

Fauna and flora.—The fauna of the State, although rich and varied, is not well known. The principal species embrace about 40 mammals, 70 birds, 13 reptiles, 7 batrachians, and a large number of insects. The floral varieties are equally numerous, embracing nearly 80 tree families, 50 fruits, 13 textiles, 12 tanning plants, 12 oleaginous plants, 11 dye plants, 10 forage plants, 4 poisonous and 16 aromatic plants, about 20 gums and resins, 30 medicinal plants, and numberless ornamental shrubs and flowers.

Resources.—The principal industries of the State are agriculture, mining, stock raising, and commerce. The most important agricultural region is included in the partidos of Mapimí, Durango, San Juan del Rio, and Papasquiaro, the agricultural products being barley, corn, wheat, cotton, tobacco, fruits, leguminous plants, and sugar cane. Mexican official statistics for 1897 estimate the number of plantations or farms at 196, of which 2 are devoted to the culture of sugar cane, 157 to cereals, 7 to maguey (mescal), 2 to tobacco, and 28 to stock raising. In 1902 the production of corn in the State was estimated at 1,584,226 hectoliters, valued at $4,664,548; wheat, 14,930,850 kilos, valued at $1,176,220; cotton, 4,880,502 kilos, valued at $1,530,607; ixtle, to the value of $78,737; tobacco, 47,780 kilos, valued at $20,000; grapes, 235,105 kilos, valued at $31,380. The grapes of Villa Lerdo and Cuencamé are famous.

The leading stock-raising sections are the partidos of Durango, El Ojo, Cuencamé, Nazas, Indé, and Papasquiaro. The number of the stock is estimated, approximately, at 1,000,000 head.

Mining.—The mining districts are the partidos of San Dimas, Tamazula, Papasquiaro, San Juan del Rio, Durango, and Nombre de Dios; gold, copper, and silver being the leading minerals. According to Mexican official figures, on the 31st of December, 1902, there were 2,469 mining claims registered in Durango, covering an area of 22,831 hectares. The Cerro del Mercado is an inexhaustible iron deposit, 2 kilometers north of Durango, which, according to the opinion of experts, "could supply all the foundries of England for a period of 330 years." Sulphur, rubies, and other valuable deposits are also found. The total mining production of the State in 1902 is officially estimated at 349,214,262 kilos, valued at $10,724,012, the number of mines in operation being 107.

Trade.—The partidos of Durango and Mapimí are the commercial

centers of the State. An active trade is maintained with the States of Sinaloa, Chihuahua, Jalisco, Zacatecas, and Coahuila; also with the United States and México City. The principal export trade consists in mineral ores (mainly gold, silver, and iron), cereals, cotton, woods, fruits, live stock, hides and skins, wools, tallow, etc., besides cotton and woolen goods to the States of Chihuahua and Zacatecas. Its principal imports are groceries, hardware, silk, cotton, wool, and linen goods, machinery, agricultural implements, mining tools, arms and ammunition, etc., the whole trade of the State being estimated at about $10,000,000 per annum. The principal ports of entry for foreign goods are Mazatlán and the customs posts of Ciudad Porfirio Díaz and Paso del Norte, or Ciudad Juarez.

Communications.—The Mexican International and the Central railroads traverse the State. The former enters through the partido of Mapimí, crosses Cuencamé and Durango, and terminates at the State capital, 879 kilometers from Ciudad Porfirio Díaz (Coahuila). In addition to the main line the road has several branches. The Central Railroad traverses the State on the tracks of the México and Ciudad Juarez line. There are several concessions for branch lines. The cities of Durango and Villa Lerdo are equipped with street-car systems, and throughout the State are about 300 kilometers of telegraph and 500 kilometers of telephone lines and an efficient mail service. There are also excellent wagon roads leading to the adjacent States and to the City of México.

Industries.—The principal manufacturing industries are tanning, the manufacture of flour, of ixtle carpets, and rope, and the extraction of fibers; there are also good pottery works, soap and candle factories, foundries, distilleries, and several cotton mills representing a value of over $500,000.

Divisions.—The State is divided into 13 partidos, subdivided into 49 municipalities. The partidos are as follows:

Tamazula, population 32,041; its principal town, bearing the same name, is situated near the Sinaloa boundary, 423 kilometers from Durango. This partido is rich in minerals.

Papasquiaro, population 44,580; its chief town, Santiago Papasquiaro, is 423 kilometers from Durango.

Indé, population 17,711, chief town, Indé, situated 316 kilometers from Durango, is rich in gold, silver, and copper mines.

Mapimí, population 61,982; its chief town, Villa Lerdo, is the second city in the State, located 263 kilometers from Durango. This is one of the most advanced sections of the State, its agricultural wealth being developed by the most modern methods and representing a value of about $2,000,000 per annum. It also contains valuable deposits of silver, gold, lead, copper, and sulphur. Villa Lerdo is connected with the station of the Central Railroad by a tramway 4 kilometers

in length, and has very fine buildings, including steam flour mills, a foundry, and several other industrial establishments. Mapimí is the next town of importance, situated 511 kilometers from Durango and 25 from the Central Railroad station. This town contains six foundries, a cotton and knit-goods mill, and other industrial establishments.

Cuencamé, population 28,670, chief town of the same name, 168 kilometers from Durango and 12 from the Pasaje station of the International Railway, is an agricultural, stock-raising, and mining district.

San Juan de Guadalupe, population 11,091; its chief town, bearing the same name, is situated 300 kilometers from Durango, 35 kilometers from San Isidro, and 30 from the Symon station of the Central Railroad.

Nombre de Dios, population 25,680, the chief town of which, bearing the same name, is situated 67 kilometers from Durango, and has in its vicinity cotton and woolen mills, using the waters of the Suchil River as motive power.

Mezquital, population 9,247; its chief town, Mezquital, is 100 kilometers from Durango.

Durango, population 72,531; its chief town, Durango, 2,100 meters altitude, population 31,092, is also the capital of the State, and is situated 918 kilometers from México City, 262 from Mazatlán, 688 from Zacatecas, 235 kilometers by rail from the Torreón station of the Central Railroad, and 870 from Ciudad Porfirio Díaz. The city contains a chamber of commerce, a bank, and many fine buildings, notably the Cathedral, which is considered one of the handsomest in the Republic, the Government Palace, the City Hall, the theater, and the mint, which, according to the "Anuario Estadístico" for 1901, had coined from 1896 to 1901 silver to the amount of $6,861,125.47, the coinage for 1900–1901 amounting to $1,266,273.71. Durango has over 10 kilometers of city and suburban railroads; electric lighting, cotton and woolen mills, foundries, flour and sugar-cane mills. It also contains two banks, one a branch of the National Bank and the other a bank of issue. Agriculture and stock raising are the principal industries of the partido, mining receiving very little attention. Its trade is very valuable. Several stations of the International Railroad are within its confines.

San Dimas, population 6,806, its chief town bearing the same name, situated 144 kilometers from Durango, is one of the best-developed mining regions of the Sierra Madre.

El Oro, population 16,479; its chief town, Real, or Santa María del Oro, is situated 311 kilometers from Durango, and is largely interested in the mining of gold, that metal being very abundant in its vicinity.

Nazas, population 13,793; its chief town, bearing the same name, is situated 167 kilometers from Durango.

San Juan del Rio, population 29,683; its chief town is San Juan del Rio, 104 kilometers from Durango.

GUANAJUATO.

The State of Guanajuato, population 1,061,724, with a capital of the same name, 2,083 meters above the sea, is one of the most favored regions of the Republic, as it contains immense natural deposits of gold and silver, fertile lands, populous cities, and fine railroads, besides being possessed of a valuable commerce and equipped with almost all the latest improvements of a highly civilized country.

Boundaries.—The boundaries are: San Luis Potosí on the north, Querétaro on the east, Michoacán on the south, and Jalisco on the west. Its area is 28,363 square kilometers.

Topography.—The topographical aspect is varied, owing to its situation on the cordillera of the Anahuac, the northeast and central sections being traversed by mountain ranges, while to the west and south extend the rich valleys of San Felipe, San Judas, and Santiago, and the fertile plain of El Bajo. The principal cordilleras traversing the State are the Sierra Gorda, on the northeast, and the Sierra de Guanajuato, in the center, which are formed by the junction of the Codornices, the San Antonio, and the Santa Rosa ranges. The highest peaks in the Guanajuato Mountains are the Gigante, 2,346 meters in height, and the Llanitos, 2,815 meters. Smaller ranges extend in various directions, inclosing the fertile valleys and plains of the State.

Hydrography.—The principal rivers are the Lerma, the Laja, and the Turbio, the last two being affluents of the former. The Lerma River rises in the State of México, traverses the State of Guanajuato for a distance of 147 kilometers, and empties into the Pacific Ocean near San Blas, in the Territory of Tepic. The Laja rises in the Sierra de Guanajuato, and, after receiving the waters of many affluents and traversing a course of 126 kilometers, empties into the Lerma. The Turbio, or Gomez, waters a territory 113 kilometers in length from its rise in the Sierra de Guanajuato to its junction with the Lerma. This State is also irrigated by the Irapuato River and several smaller streams. The only lake is Yuririapúndaro (lake of blood), which is 97 square kilometers in extent and contains several small islands. Near the valley of Santiago there is a large circular well, known as the Albercas, which is believed to be the crater of an extinct volcano. Its waters are not potable and its depth has never been ascertained. Mineral springs are abundant.

Climate.—The climate is temperate and agreeable, except in the higher altitudes of the mountain ranges, the mean temperature being 21° C. (about 70° F.), and the highest 28° C. (82.40° F.) during the hot months. The prevalent diseases are malarial fevers and typhus. During the rainy season the rainfall is heavy in the plains and valleys and moderate in the mountains. This season extends from the middle of May until the beginning of July. The prevailing winds are from the northeast, changing to southeast at the approach of the rainy season.

Fauna and flora.—The fauna of the State is very rich, comprising, in all, 510 species, divided as follows: 41 mammals, 206 birds, 44 reptiles, 15 batrachians, 7 fishes, and 148 insects. The flora is no less rich, embracing over 23 kinds of wood, 44 fruit trees and plants, 32 textiles, 11 tanning plants, 15 oleaginous plants, 16 dyewoods, about 80 medicinal plants, 12 forage plants, 18 aromatic plants, 15 gums and resins, and numberless ornamental flowers and shrubs.

Resources.—According to the location of the partidos, the leading industries are mining, agriculture, and cattle raising, the former taking first rank in Guanajuato, La Luz, Bietona, and San Felipe, and agricultural and stock raising in the plains and valleys. The principal agricultural products are cereals and leguminous plants of all kinds, fruits, chili, alfalfa, and canary seed, valued at about $21,000,000 per annum, besides which tobacco and zacatón receive considerable attention. According to Mexican official figures, 1897, there were in the State 394 plantations or haciendas, of which 346 were devoted to the culture of cereals. The principal agricultural products of Guanajuato for 1902 are officially given as follows: Corn, to the value of $5,500,000 in round figures; wheat, $2,500,000; tobacco, $18,000.

The total value of the stock-raising industry, comprising in all about 1,000,000 head, is estimated at $10,000,000, hogs, sheep, and goats forming the principal elements. The annual production of wool is calculated at 200,000 kilograms, worth $80,000.

Mining.—The State of Guanajuato is one of the richest mineral regions in the world. The mining region follows the line of the angle formed by the Sierra Gorda and Sierra de Guanajuato, there being in all five mining districts, as follows: Sierra Gorda, Allende, Santacruz, Guanajuato, and Leon. According to the "Geografía y Estadística," by Velasco (1890), there were 273 mines, as follows: 31 silver and gold, 124 silver, 44 mercury, or cinnabar, 24 tin, 5 iron, 1 lead, 10 argentiferous lead, 3 copper, 15 argentiferous copper, 5 magistral, or sulphide of copper, 1 bismuth, 7 hematite, 1 sulphur, and 1 plastic clay; and according to the "Anuario Estadístico" there were, on the 31st of December, 1901, 625 claims registered, covering an area of 6,891 hectares.

In 1901, 92 gold and silver mines in the State, containing 2,051 hectares, employing 6,790 hands, produced 120,000,000 kilograms of ore, valued at $2,711,859, and in 1902 the total production amounted to 147,680,000 kilograms, valued at $3,162,000, the number of mines in operation being 67.

Trade.—Guanajuato is the most important mercantile center of the Republic, both the Central and Mexican National railways deriving from local traffic greater profits than in any other State. Its total trade can be estimated at $67,000,000 per annum, divided as follows: Exports of minerals to México City, the United States, and Europe.

CITY OF GUANAJUATO, STATE OF GUANAJUATO.

$20,000,000; exports of agricultural and other products to home States, $10,000,000; exports of industrial products, $2,000,000; imports from México City, United States, and Europe, $12,000,000; imports from other Mexican States, $3,000,000, the balance being made up by the local trade. The principal exports are mineral and agricultural products, live stock and cotton goods, while the imports from México City and the United States and Europe are groceries, ready-made clothing, textiles, hardware, drugs, arms and ammunition, hats, canned goods, agricultural and mining machinery, and tools; and from the Mexican States, mescal tequila, fruits, pulque, coffee, etc.

Communications.—The Mexican Central Railroad traverses the State in three directions: First, from east to northwest on the line from México City to Ciudad Juarez, or Paso del Norte (152 kilometers); second, from the center to the southwest on the branch line from Irapuato to Guadalajara (84 kilometers); and third, from the center to the northeast on the branch line from Silao to Guanajuato (23 kilometers). The Mexican National Railroad runs from southeast to north on the line from México City to Nuevo Laredo, a distance of 271 kilometers, and the Salamanca and Valle de Santiago Railroad has an extent of 18 to 20 kilometers in the municipality of Salamanca. The street railways in the cities of the State measure about 14 kilometers. The State is crossed in all directions by good wagon roads, and there exists an extensive network of telegraph and telephone wires, as well as an efficient postal service.

Industries.—Among the flourishing industrial establishments are 350 woolen mills, with a yearly output of 90,000 pieces of cloth; 45,000 yards of carpet and other fabrics; 853 cotton mills producing an average of 200,500 pieces of cotton (manta), 46,600 pieces comboyos, 550,000 rebozos, and 100,000 kilograms of twine, the consumption of these factories being about 815,000 kilograms of wool and 1,000,000 kilograms of cotton annually. There are besides 72 flour mills (steam and hydraulic power), yielding about 15,000,000 kilograms of flour per annum, linseed mills, saddleries, potteries, powder works, distilleries, tanneries, and foundries.

Divisions.—The State is divided into 5 departments, subdivided into 32 partidos. The departments are:

Allende, population 46,933 (4 partidos); its principal cities are San Miguel Allende and Dolores Hidalgo, situated 71 and 66 kilometers, respectively, from Guanajuato.

Celaya, population 46,408 (11 partidos); its principal city, bearing the same name, is situated at the intersection of the Mexican National and Mexican Central railways. It has a line of street cars 3 kilometers in length extending to the railway station. Other towns are: Acámbaro, on the Mexican National Railway; Aspaséo, and Salvatierra.

Guanajuato, population 387,718 (9 partidos); its principal city, 2,083 meters above the sea, bears the same name, it being also the capital of the State and containing 39,404 inhabitants. The city of Guanajuato is situated 406 kilometers by rail from México City, 344 from San Luis Potosí, 160 from Querétaro, and 212 kilometers from Guadalajara. It is located in a narrow valley on the river Guanajuato. The principal buildings are the State government palace, the Palace of Congress, the mint, the State college, several churches, two theaters, hospitals, a bull ring, the market de la Reforma, the Pantheon, and the Castle of Granaditas, where the heads of Hidalgo, Allende, Aldama, Jimenez, and other patriots were hung on iron hooks during the war of independence.

The mineral wealth of Guanajuato has always commanded the attention of the world. From 1812 to 1896 the combined value of gold, silver, and copper coined by the Guanajuato mint amounted to $309,077,468.25 Mexican silver, the gold coinage being estimated at $21,178,328; silver, $287,884,476.25, and copper, $14,664. The figures from 1896–1901 are, silver, $13,957,746; gold, $599,914.88; and from 1901–1902 are, silver, $11,868,924, and gold, $488,024. This city is the commercial center of the State, and one of the most important in the Republic. It has a branch road connection with the Central Railroad, also 10 kilometers of street railways, electric lighting, and all modern improvements. Other leading towns are Cuitzéo de Abasolo, Irapuato (an important market on the Central Railroad), La Paz, Salamanca, Silao, and Valle de Santiago, situated in a fertile valley bearing the same name.

Leon, population 193,932 (4 partidos); its two leading towns are Leon de los Aldamas and San Francisco del Rincón, the former 56 kilometers from Guanajuato, and one of the principal manufacturing centers of the Republic, and the latter situated on the Central Railroad.

Sierra Gorda, population 93,456 (3 partidos); its principal cities are San Luis de la Paz, 98 kilometers from Guanajuato, San José de Iturbide, Xichú, Santa Catarina, and Victoria.

GUERRERO.

The State of Guerrero, population 479,205, its capital Chilpancingo, 1,193 meters altitude, population 7,497, is one of the maritime States of the Republic. It has a promising future, but so far has been but little explored and has a small population, lacks communication facilities, and its territory is mountainous and rough.

Boundaries.—The boundaries are the States of México and Morelos on the north; Puebla on the northeast; Oaxaca on the east and southeast, and the Pacific Ocean on the southwest. The area is given as 64,756 square kilometers.

Situation.—The Pacific coast line of the State is 500 kilometers in

extent, the shores being low, sandy, well sheltered, and possessing excellent ports and harbors. Acapulco, the principal port of the State, is classed among the finest harbors of the world, by reason of its beautiful, well-sheltered bay, measuring 6,285 meters in length by 3,141 in breadth, and having a depth of 84 meters. Other Pacific ports in the State are Petlacala, Sihuatanejo, and Papanoa.

Topography.—Guerrero is mountainous throughout almost its entire extent, being traversed by the Sierra Madre del Sur, which reaches its greatest altitude at 2,800 meters. The valleys between the cordilleras are narrow, and the highest peaks are Tlacotepec and Tiotepec, 2,800 meters high, and Escalera, 2,521 meters in height.

Hydrography.—The rivers of the State, on account of the broken surface of the territory, have very rapid currents. The principal is the Mexcala or Balsas, also known as the Atoyac or Poblano. Its headwaters are in the Tlaxco Mountains of the State of Tlaxcala, whence it enters Guerrero on the east, dividing the State into two sections, the southern occupied by the Sierra Madre range and the northern by the slopes of the mountain chains from the States of México and Morelos. The river is 687 kilometers in length, but is navigable for small craft only. All the waters of the State are tributary to it. The principal lakes are Pazahualco, Chantengo, Nexpa, and San Marcos.

Climate.—Climatic conditions vary according to the altitude of the districts, the cold belt beginning beyond 2,000 meters, the temperate lying between 1,000 and 2,000 meters, and the hot lands situated below the 1,000 meters. On the coasts the heat is excessive, from 35° to 36° C. (95° to 96°.80 F.), and the rain falls in torrents, precipitation being moderate in the temperate lands only. Frosts are frequent in the high altitudes of the Sierras. Fevers, leprosy, and affections of the respiratory and digestive organs are the prevailing diseases.

Fauna and flora.—The fauna of the State, though rich and varied, is not well known. It embraces over 55 species of mammals, over 80 birds, 50 reptiles, 5 batrachians, 40 fishes, and numberless insects. The flora is worthy of note, comprising over 150 trees, 75 fruits, 33 textile plants, 17 tanning plants, 15 oleaginous, 25 dye, 10 forage, and an equal number of poisonous plants, 20 aromatic plants, about 40 gums and resins, 200 medicinal plants, and countless ornamental shrubs and flowers.

Resources.—The development of the immense agricultural wealth of the State only awaits the establishment of railroad facilities, immigration, and better wagon roads, when the cultivation of cotton, coffee, tobacco, rubber, vanilla, etc., may be advantageously undertaken on a large scale. The agricultural production of the State is about $2,200,000 per annum, the leading articles being sesame seed, cereals, leguminous plants, fruits, tobacco, vanilla, coffee, cacao, and

textile fibers. In 1887 the number of plantations estimated as under cultivation was 144, as follows: Cotton, 15; coffee, 1; sugar cane, 72; cereals, 25, and 31 cattle ranches. Official figures for 1902 give the agricultural production of the State as follows: Corn, $1,017,966; sugar-cane products, 3,355,234 kilos, at $391,470; textile fibers, $32,000; coffee, $25,000; tobacco, $25,200. The value of stock may be estimated at about $3,000,000, and dairy industry is under process of development.

Mining.—Within the limits of the State lie one of the richest mining regions of the country, although as yet complete development has not been attained. Gold, silver, mercury, lead, iron, coal, sulphur, granite, and marble are among the principal mineral products; also very fine opals of three varieties, topazes, diamonds, and, according to report, salt. The exploitation of these products has been greatly hampered by lack of communication facilities, less than two-thirds of the total number of mines being in operation. During the year 1902 the mining production of the State is reported by the "Anuario Estadistico" at $231,000, the number of mines in operation being 310.

Trade.—The commerce of Guerrero is of little importance, due to the lack of railways and to the paucity of the population, which circumstances may be accounted for on the one hand by the topography of the country and by the unhealthy climate on the other. Exports consist of minerals, live stock, cotton, fruits, and woods, sent to México City, and of hides and skins, cotton, rice, tortoise shell, pearl conches, and fruits sent abroad; while the imports include all kinds of manufactured products, mainly food products, hardware, dry goods, machinery, agricultural implements, etc. There is a maritime custom-house at Acapulco, its trade being approximately estimated at $500,000, equally divided between imports and exports. The total trade of the State is fixed at about $5,000,000 in round numbers.

Communications.—There are practically no railroads, as the Interoceanic Railway, which is destined to connect the port of Acapulco on the Pacific with Veracruz on the Gulf, and with the national capital, is not yet completed, and the same is true of the México, Cuernavaca and Pacific, and of the Michoacán and Pacific lines, which are to traverse certain portions of the State. There are, however, extensive telegraph and telephone lines, as well as an efficient mail service and some wagon roads, especial mention being made of a road connecting México City and Acapulco. The port of Acapulco connects with foreign countries by means of the Pacific Mail Steamship Company and the "Compañía Mexicana de Vapores del Pacífico y Golfo de California." During 1902, the number of vessels entering the port of Acapulco was 213, of which 167 were steamers, while those sailing from the port were 212, there being 167 steamers.

Industries.—The value of the manufacturing industry of the State, estimated at about $3,000,000 annually, is confined to the manufacture of sugar-cane products, mescal wine, palm oil, cotton spinning, tanning, and the development of apicultural products.

Divisions.—The State is divided into fourteen districts, subdivided into fourteen municipalities. The districts are:

Aldama, population 54,717, with its chief town bearing the name of La Unión, situated 566 kilometers from Chilpancingo.

Mina, population 50,926, an important mining section; its principal town, Coyuca de Catalán, is 293 kilometers from Chilpancingo.

Alarcón, population 34,164, rich in minerals and remarkable for the cave of Cacahuanilpa, said to be more beautiful than the Mammoth Cave in the United States. The chief town is Taxco de Alarcón, 147 kilometers from Chilpancingo.

Hidalgo, population 31,730; its chief town, Igualá de Iturbide, is 135 kilometers from Chilpancingo.

Alvarez, population 43,498; chief town, Chilapa de Alvarez, 46 kilometers from Chilpancingo.

Zaragoza, population 20,604; chief town, Huamuxtitlán, 222 kilometers from Chilpancingo, situated in a very fertile region.

Morelos, population 43,540; chief town, Tlapa or Ciudad Comonfort, 168 kilometers from Chilpancingo.

Abasolo, population 25,471; chief town, Ometepec, 190 kilometers from Chilpancingo.

Allende, population 28,282; chief town, Ayutla de los Libres, 151 kilometers from Chilpancingo.

Tabares, population 43,136; its chief town, Acapulco de Juarez, population 4,932, is an important seaport, 188 kilometers from Chilpancingo and 495 kilometers from México City. The bay of Acapulco is the most sheltered of the Mexican ports, and is capable of accommodating 100 vessels of deep and 200 of lighter draft. The steamers of the Pacific Mail and of the Mexican International Company touch at Acapulco, where there is a custom-house and a beacon light. The exports through Acapulco in 1901–2, as given by the "Boletín de Estadística Fiscal" for that period, amount to about $200,000, while the exports are valued at $201,000.

Galeana, population 21,297; its principal town, Tecpan de Galeana, located 327 kilometers from Chilpancingo.

Chilpancingo, or Bravos, population 33,088; its principal town, Chilpancingo de los Bravos, or Ciudad Bravos, population 7,497, the capital of the State, is a small but important city, 319 kilometers from México City and 178 from the port of Acapulco. There are some fine buildings in the town, which is lighted by electricity.

Guerrero, population 28,128; its principal town is Tuxtla de Guerrero, 13 kilometers from Chilpancingo.

HIDALGO.

The State of Hidalgo has a population of 605,051. Its capital is the city of Pachuca, 2,447 meters altitude, population 37,487.

Boundaries.—The State is bounded on the north by the States of San Luis Potosí and Veracruz, on the east by Puebla, on the south by México and Tlaxcala, and on the west by Querétaro, its area measuring 22,215 square kilometers.

Topography.—The northern portion of the State is mountainous as compared with the southern, the orographic system being a continuation of the Sierra Madre, which receives different names in the various districts traversed, the principal ranges being Tulancingo, Zimapán, Jacala, Zacuatilpam, Hueyutla, and Pachuca. The highest peaks are Tapetillán, Crestón, Cerro Alto, Cresta de Gallo, Organos, and Cerro de Navajas, the latter being 3,212 meters in height. There are several curious caves in the State. The southern and western portions are generally flat, the principal plains being the Apan, Mexquital, Tula, and the valleys of Tulancingo and Agua Zarca, and the Llanura Grande.

Hydrography.—There are no large rivers, the principal streams being the Tula and its tributaries, the Amajague and its affluents, and the Metztitlán or Rio Grande and its branches. There are other rivers of lesser importance and several waterfalls, among them being the Regla cascade, whose waters are used by the Electric Power Company to supply motive power for several reduction works. The largest lake is the Metztitlán, which is 17 kilometers in length. Mineral springs abound.

Climate.—The climate is generally mild rather than cold on the uplands and plateaus, and hot or temperate according to the varying altitudes of the lower districts.

Fauna and flora.—The fauna and flora are rich and varied, resembling in general characteristics those of the other States of the Republic.

Resources.—The agricultural products consist in the main of cereals, coffee, sugar cane, cotton, tobacco, maguey, and leguminous vegetables. Mexican official statistics for 1897 give the State 208 plantations, divided as follows: Maguey pulque, 129; cereals, 52; sugar cane, 8; tobacco, 1; and 18 cattle ranches. The production of the State for 1902 is estimated thus: Cereals, to the value of $2,750,000; sugar-cane products, 5,478,129 kilograms, valued at $460,000; rum, 17,100 hectoliters, valued at $197,300; and maguey products to a value of $25,000, pulque alone amounting to 776,835 hectoliters, valued at $1,096,586.

Mining.—Mining is the most important industry, as almost every district is a mining center, the principal being Pachuca and Zimapán, the former containing the regions of Real del Monte, Atotonilco el

Chico, Santa Rosa, Capula, Tepenené, and Potosí, and the latter, Cardonal, Bonanza, Pechuga, Jacala, La Encarnación, San José del Oro, and Verdosas. The chief metals found are gold, in small quantities; silver, mercury, copper, iron, lead, zinc, antimony, manganese, cinnabar, and plumbago. Other mineral substances are coal, marble, granite, opals, garnets, etc. There are in operation 36 reduction works for the treatment of the finer metals and 6 devoted to the smelting of iron ore. Mexican official statistics for 1902 credit the State with a production of 138,223,000 kilos metal of all kinds, valued at about $5,400,000, the number of mines in operation during the year being 109.

Communications.—The railroad lines traversing the State are the "Hidalgo y del Nordeste," connecting Pachuca with México City (109 kilometers); the Mexican Central and the Mexican International, covering, in all, an extent of 371 kilometers. There is a street-car line 8 kilometers in length, in Pachuca, besides several private railways, constructed in connection with the working of the mines. The total length of telegraph wires is estimated at 918 kilometers, with 32 stations. There are also numerous telephone lines and an efficient mail service.

The principal industries are the reduction of ores, the manufacture of cotton and woolen goods, and of pulque, bricks and tiles, matches, etc.

Divisions.—The State is divided into 15 districts, subdivided into municipalities. The districts and their chief towns are the following:

Atotonilco el Grande, population 26,619; chief town of the same name, 32 kilometers from Pachuca, the capital of the State.

Actopam, population 47,797; chief town Actopam, 30 kilometers from Pachuca.

Apán, population 19,002; chief town Apán, 72 kilometers from Pachuca.

Huichapam, population 31,566; chief town of the same name, 140 kilometers from Pachuca.

Huejutla, population 76,811; chief town Huejutla, 192 kilometers from Pachuca.

Ixmiquilpam, population 46,978, chief town of the same name, 88 kilometers from Pachuca.

Jacala de Ledesma, population 30,299, chief town of the same name, 180 kilometers from Pachuca.

Metztitlán, population 26,416, chief town Metztitlán, 76 kilometers from Pachuca.

Molango, population 37,019, chief town of the same name, 116 kilometers from Pachuca.

Pachuca, population 99,608; its chief town, Pachuca, population 37,487, is also capital of the State. It is the principal city of Hidalgo, on account of its commerce, population, and mining industry. It is

connected with México City by the Hidalgo, Mexican, and Central railways. The city contains several fine buildings, among others the Palace of Justice, the Scientific and Literary Institute, a Meteorological Observatory, the School of Mining, and a public library. In the district of Pachuca are found the principal mining sections of the State.

The other districts are Tula, population 39,572; Tulacingo, population 48,095; Tenango de Doria, population 25,205; Zacuatilpam, population 21,259; Zimapán, population 28,805, their chief towns bearing the names of the districts.

JALISCO.

The State of Jalisco, population, 1,153,891; capital city, Guadalajara, 1,566 meters above the sea, population 101,208 inhabitants, is one of the richest mining and agricultural sections of the Republic. The State covers an area of 86,752 square kilometers and has a coast line of 500 kilometers.

Boundaries.—One State, which is irregular in shape, is bounded on the north, east, and south by the States of Durango, Zacatecas, Aguas Calientes, San Luis Potosí, Guanajuato, Querétaro, Michoacán, Colima, and the Territory of Tepic, and on the west by the Pacific Ocean.

Climate.—Jalisco possesses a great variety of climates. A large portion of the State is traversed by the Sierra Madre range, which gradually slopes to the Pacific, giving rise to nearly every climatic condition known to the temperate and torrid zones. The high tablelands of the eastern portion are cold. In this region cereals, as well as many other products of the temperate zone, can be produced. The valleys between the mountains are well watered and exceedingly fertile. In these favored places flourish, according to the elevation, sugar cane, cotton, vanilla, tobacco, oranges, coffee, etc. Sugar cane grows very rapidly in this State, and once planted it does not have to be renewed for eight or ten years, which is a great advantage over Morelos and other States, where cane only grows by means of artificial irrigation and must be replanted every two years.

Topography.—The eastern portion of the State is traversed by the Sierra Madre range, in which occur a number of imposing mountain peaks. The most noted of these are the Tapalpa, Tigre, Nevado, and Colima. The latter is an active volcano, the elevation of which is 4,378 meters above the level of the sea. The northern and northeastern portions of the State are very mountainous and form a veritable network of spurs and isolated peaks from the Sierra Madre range. Between these are found picturesque and fertile valleys of varying elevations and extent. The State in its entirety possesses a vast territory, watered by numerous lakes and rivers.

Hydrography.—The largest and most important stream is the Santiago, or Lerma, River. This river rises in Lake Chapala in the

extreme southeastern portion of the State, and flows in a northwesterly direction through Jalisco and the Territory of Tepic, emptying into the Pacific Ocean at a point north of the port of San Blas. It is about 750 kilometers long, and drains a territory containing, it is estimated, 25,000 square kilometers. In its course toward the sea this stream forms beautiful cascades near the village of Juanacatlan in the vicinity of the city of Guadalajara. These are of such a grand and imposing character that they have been appropriately called the Niagara of México. Their height is about 20 meters. The river at this point is 160 meters wide. The force generated by these celebrated falls is enormous, and a large electric plant has been erected there. This plant supplies electric power to the city of Guadalajara, the capital of the State, 7 kilometers distant. This water power is also utilized by a large number of factories in Guadalajara and vicinity in the operation of their plants, and is fast making that city one of the great manufacturing centers of the Republic.

Other important rivers of the State are the Acaponeta and San Pedro, both of which flow into Lake Mexcaltitlán. The Armenia and Ameca rivers are also streams of considerable size and importance. One of the most beautiful lakes of the State, and the largest in the Republic, is Lake Chapala, the surface area of which is 234 square kilometers. The waters of this lake contain a great abundance of edible fish. German carp abound, the Mexican Government having stocked the lake some years ago with this variety of fish. Lake Chapala is also quite a summer resort. Comfortable hotels have been built upon its shores, and hundreds of people from Guadalajara and surrounding country spend the summers there.

Fauna and flora.—The fauna and flora of this State is as rich and varied as that of any other Mexican territory.

Resources.—The peculiar topographical conditions of the State, with its variety of climates, make of this region one of the richest agricultural sections of the country.

Agriculture.—Sugar is one of the leading products, and the cultivation of cotton could be greatly increased, the native product at present not being sufficient to supply the needs of the cotton industry, which has developed to such an extent in México that nearly 70 per cent of the raw material consumed has to be brought from the United States. Cotton planters would, therefore, be sure to find in the Republic an excellent home market for their product. The lowlands on the coast are hot, and on them thrive a great variety of tropical and subtropical products, while the climate, invigorated by the sea breeze, is not as enervating as that of the eastern coast of México. Cedar, pine, oak, and other valuable trees are found in the mountains, and cabinet woods also abound. If the projected railroad from Aguas Calientes to Chamela, a small port on the Pacific, is built the forest lands will

greatly enhance in value. At present, owing to the lack of easy means of transportation, the exploitation is difficult and timbered lands in some parts of the State can now be bought for $2 Mexican silver per hectare.

The principal agricultural production of the country according to the "Anuario Estadístico" for 1902, was, during that year, cereals $10,200,000 in round numbers, corn being the largest item, being represented by $9,885,000; sugar-cane products, 5,498,000 kilos, valued at $465,180; alcohol to the value of $500,000; pulque, $1,096,586; other maguey products, $70,000; coffee, $80,000, and tobacco, $62,000.

Mining.—Jalisco contains a great variety of minerals. Within its boundaries are to be found at the present time numerous silver, gold, copper, iron, lead, and cinnabar mines. The silver mines of San Pedro Analco and of Atemajac are the most important. The concessionaires have recently been negotiating the sale of this latter mine for $800,000 gold. A United States company is developing the gold mines near Tequila, which yield from one to four ounces per ton. The Calabra and Santo Domingo mines, near Ezatlan, have produced large quantities of silver ore containing a certain percentage of gold. These mines are still under development. The total mineral production of the State in 1897 was $2,252,999 Mexican silver. A large quantity of ore is shipped annually to the smelters at Aguas Calientes, San Luis Potosí, Monterey, and Ciudad Juárez, to be reduced there. There are a number of small smelters in the State, and considerable quantities of ore are treated in these, and by the *patio* process. Rich copper deposits have been discovered in various parts of the State, and within the last few years many claims have been denounced and new mines opened. The field is practically a virgin one, and offers rich rewards to the miner and capitalist. The number of mining claims registered up to December 31, 1902, was 719, covering an area of 4,880 hectares, while the total mineral production of the State is estimated at about 80,000,000 kilos, valued at over $1,000,000; the number of mines in operation being 87, according to the "Anuario Estadístico," for 1902. The Federal assay office in Guadalajara treated during the same period gold to the value of $111,051 and silver $4,586,134 for coinage, and about $80,000 gold and $1,000,000 silver for export.

Trade.—In the district of Tequila, west of Guadalajara, one of the principal products cultivated is the maguey, a plant belonging to the agave family and from the sap of which a liquor resembling gin is obtained by distillation. This beverage, called "tequila," has an enormous consumption in the northwestern part of México. Lands planted in this variety of maguey bring large prices in México. One farm containing less than 1,700 hectares was sold for 600,000 *pesos* ($300,000). The government of Jalisco is endeavoring to introduce

PALACE OF GUADALAJARA, STATE OF JALISCO.

the culture of the Yucatán henequen, the plant of which resembles in appearance the maguey. Agricultural enterprises on a large scale could be successfully carried on in the part of the State comprised in the so-called hot country, where virgin lands cleared of underbrush can be obtained at very low prices. During the last few years large shipments of oranges from the La Barca district have been made to the United States. These oranges are of a rich color, delicately flavored, and are sweet and luscious. They come into the market a few weeks before the early California oranges, and are yearly becoming more highly prized in the markets of the United States.

Communications.—The main line of the Mexican Central Railway passes through the northeastern portion of the State. A branch line of this road runs from Lagos to La Barca, Guadalajara, and Ameca. This branch will ultimately be extended to the Pacific coast, opening up a region rich in valuable forests and agricultural and mineral wealth.

Industries.—The sugar industry is of great importance, the average annual production reaching 12,000 tons of refined sugar and 10,000 tons of raw sugar, worth, respectively, about $2,500,000 and $1,200,000. The district of Cocula alone, situated in the temperate zone, produces 10,000 tons of sugar, or three times more than the entire State of Veracruz. A "hacienda" situated in this district not far from Santa Ana has realized a profit of $800,000 in one year. Morelos is the only State whose production exceeds that of Jalisco.

Cattle raising is also carried on in Jalisco to advantage and profit. This industry is as yet in its infancy, but is rapidly increasing in value and importance. The number of large ranches or farms in this State is also considerable, many of which constantly employ 500 or 600 laborers and 200 to 300 horses and mules daily in the operation of the same.

Divisions.—The State is divided into twelve cantons, the names and populations of which are as follows:

Guadalajara	205,664	Colotlán	68,730
Lagos	104,135	Ciudad Guzmán	134,612
La Barca	165,948	Mascota	52,712
Sayula	87,065	Teocaltiche	94,439
Ameca	59,345	Ahualulco	58,615
Autlán	70,227		
Jocotepec	52,399	Total	1,153,891

Guadalajara, the capital of the State, with 101,208 inhabitants, is one of the finest cities in the country, and is known as the "Pearl of the West." It contains a large number of government buildings, schools, and educational institutions, a large and handsome cathedral, and the largest theater in the Republic, a Federal assay office, three banks, and a chamber of commerce. Many magnificent public parks adorn and

beautify the town. The cotton industry is one of the principal industries of the city. La Compañia Industrial Manufacturera (capital 4,000,000 *pesos*), has established a spinning mill and 700 looms at Juanacatlan, 26½ kilometers from Guadalajara. The machinery is run by the celebrated waterfalls of Juanacatlan. Manta or unbleached cotton is the principal product. A few kilometers from Guadalajara, but in another direction, the Compañia Industrial of Guadalajara, with a capital of 2,000,000 *pesos*, owns the cotton factories of Atemajac and Experiencia. There are 164 looms at Atemajac and 180 at Experiencia, all imported from England. There are also two other cotton factories in the State of Jalisco, those of Escoba and Rio Blanco, but they are of much less importance. There are no woolen mills, with the exception of a few hand looms. The leather industry is greatly developed. There are in Guadalajara saddleries, shoe factories, and two tanneries; also two breweries, a paper mill, and canning factories. The city is in a very prosperous condition, and many opportunities exist for the establishment of new industries.

In addition to Guadalajara, the State of Jalisco contains a number of other important cities, as shown by the following table:

Name.	Population.	Name.	Population.
La Barca	7,100	Zacoalco	6,515
Zapotlanejo	20,270	Autlán	7,715
Ciudad Guzmán	17,596	Teocaltiche	8,881
Lagos	16,000	Ameca	7,952
Sayula	7,883	Cocula	5,616

The number of public schools in the State exceeded, not including church and private schools, 600 in 1902. These schools had 36,896 pupils enrolled, with an average attendance of 42,385. The number of scholars attending church and private schools during the same period was 28,108. The State of Jalisco spends more than $300,000 annually in the maintenance of its schools. Guadalajara has a number of schools devoted to higher education, including the College of Medicine and Pharmacy, the Law School, the Lyceum, and the Normal School.

MÉXICO.

The State of México, population 934,463; capital, the city of Toluca, 2,671 meters above the sea, population 25,904, is among the most important agricultural and industrial sections of the Republic. Its territory is not very large, but it is fairly well populated and embraces within its limits such valleys as the Toluca Valley and the valley of México, which are classed among the most beautiful and fertile in the world.

Boundaries.—Its boundaries are the State of Hidalgo on the north, Tlaxcala and Puebla on the east, Morelos on the south and southeast,

Guerrero on the south and southwest, and Michoacán on the west. The Federal District lies to the east of the State.

Topography.—The State occupies one of the most beautiful regions on earth. The northern portion is a plain, intersected by small foothills and covered with salt lakes and marshy lands; this is the land of the cactus and agave. The eastern part is occupied by the Popocatepetl range, fertile lands, snow-covered peaks, smoking volcanoes, and the celebrated valley of Texcoco. The center is the region of forests and mountains, the valley of Toluca occupying the highest plateau. The Sierra Nevada mountain range, with its snow-covered peak of Popocatepetl, the highest in the country, rising 5,400 meters above sea level, traverses the eastern section; to the north is Iztaccihuatl, 4,786 meters in height; and to the south runs the Ajusco range, which marks the limit of the valley of México; its highest peak is Ajusco, 4,153 meters high. The Sierra de Guadalupe lies north of the Federal District, and to the northwest of the Ajusco range is the snow-capped volcano of Toluca or Xinantecatl, 4,476 meters above the level of the sea, in whose crater are two lakes of potable water. The valley of Toluca is a beautiful spot, more than 2,000 meters above sea level, being situated on the highest plateau of the Republic and embracing within its limits the Federal District and the City of México, capital of the Republic.

Hydrography.—The State is divided into two hydrographic basins—the valley of México and the basin of the Lerma River, the latter extending to the States of Querétaro, Michoacán, and Guanajuato. The Lerma is by far the most important stream of the country, traversing an extent of 452 kilometers from its source to its mouth in the Chapala Lake. Next in importance is the Cuautitlán or Desagüe River; following, according to rank, the Tula, the Tajo de Nochistango. This valley also contains five important lakes, three of which lie wholly within its boundaries, viz, Zumpango, San Cristobal, and Xaltocán, while the Texcoco and Chalco extend into other States. The Lerma lagoon lies wholly within the State.

Climate.—Climatological conditions vary according to altitudes. In the valley of Toluca, 3,176 meters above sea level, it is exceedingly cold, while the valley of México enjoys a temperate and healthy climate, although it is somewhat variable. The rainfall is uncertain—scarce at times and then again falling abundantly. Frost is not frequent.

Fauna and flora.—Both fauna and flora are extremely rich, embracing as many species as the most favored States.

Resources.—The principal agricultural products are cereals, leguminous plants, and spices. Besides these there are rice, coffee, sugar cane, linseed, tobacco, and the maguey plant. The total production

varies in value from ten to twelve millions of pesos per annum. Official statistics for 1902 estimate at 17,697,763 kilos the production of cereals in the State, with a value of $8,716,364; sugar-cane products (direct) 966,000 kilos, at $118,000; sugar-cane rum, $115,000; pulque, 207,500 hectoliters, at $440,000, and *tlachique*, another maguey product, 610,326 hectoliters, valued at $1,062,765. Stock raising is also one of the principal sources of wealth, with an estimated value of $17,000,000, with the following relative rank: Sheep, cattle, hogs, goats, horses, asses, and mules.

Mining.—Many rich mining districts are within the State, though their wealth is not yet fully exploited. Gold, silver, and lead are the principal metals. On December 31, 1902, there were registered 375 claims, covering 4,191 hectares, the total production of the mines in operation in the State, 24 in number, being estimated at 186,567,257 kilos, valued at $5,644,953.

Trade.—Annual trade of the State may be safely estimated at about seven to eight millions of pesos, the principal commercial centers being Toluca, Tenancingo, Cuautitlán, Chalco, and Amecameca, most of the products going to México City.

Communications.—The principal railway lines traversing the State are the Mexican National, the International, and the Interoceanic. The line from México to Salto has an extent of 44 kilometers, the México and Veracruz 60 kilometers, and the Central 66 kilometers. The Interoceanic has two tracks, one from México to Veracruz, and one from Morelos to Acapulco, the first 69 kilometers in length and the latter 86 kilometers. The several street railways measure 39 kilometers in length. Telegraph, telephone, and mail communications are efficient, there being over 400,000 meters of telegraph wires, 900,000 of telephone, and 23 post-offices. The State is crossed in all directions by wagon roads.

Industries.—The leading industries are the manufacture of cotton and woolen goods, bricks, cheese and butter, wines, glassware, wheat, flour, sugar, alcohol, pottery, and pulque.

Divisions.—Politically the divisions are into 15 districts, subdivided into municipalities. The districts are:

Jilotepec de Abasolo, population 72,137; its chief town, Jilotepec, 39 kilometers from Toluca, the capital of the State.

Cuautitlán, population 33,048, with a chief town bearing the same name, 109 kilometers from Toluca.

Zumpango de Victoria, population 28,363; its chief town, Zumpango de la Laguna, is 122 kilometers from Toluca.

Otumba de Morelos, population 36,218, the chief town of which, Otumba de Gómez Farias, is 114 kilometers from Toluca.

Texcoco de Mora, population 58,921, the chief town of which, Texcoco, near a lake of the same name, is a fine town containing several

manufacturing establishments and the repair shops of the Interoceanic Railroad.

Chalco de Díaz Covarrubia, population 69,478; its chief town, Chalco, is quite a commercial center, a line of tramways running between it and Tlalmanaco, 21 kilometers in length.

Ixtlahuaca de Rayón, population 96,947; its chief town bears the same name, and is situated 78 kilometers from Toluca.

Valle de Bravo, population 49,866, the chief town of which bears the same name and is situated 55 kilometers from Toluca.

Toluca de Lerdo, population 128,735; its chief town, Toluca, population 25,904, is also the State capital, and is a very beautiful city, containing many fine public buildings, breweries, ice factories, a chamber of commerce, a bank, cotton mills, oil and flour mills. It is the principal commercial town in the State, and is situated 73 kilometers from México City (by rail two hours and fifty minutes), 497 kilometers from Veracruz, and is connected by rail with the principal cities of the Republic and of the United States.

Tenango de Arista, population 71,966; its chief town, of the same name, 25 kilometers from the capital of the State, has cotton, oil, and flour mills.

Lerma, population 46,703; its chief town, Lerma, is 13 kilometers distant from Toluca.

Tlalnepantla de Comonfort, population 61,486; its chief town, Tlalnepantla, is 12 kilometers from México City, with which it is connected by rail, and 77 kilometers from Toluca.

Tenancingo de Degollado, population 66,233; its chief town, Tenancingo, is an important commercial town 46 kilometers from Toluca.

Temascaltepec, population 48,702; its chief town, bearing the same name, is 25 kilometers from the capital of the State.

Sultepec de Alquisiras, population 65,660; its chief town, Sultepec, is 67 kilometers from Toluca.

MICHOACÁN.

The State of Michoacán de Ocampo, population 930,033; its capital, Morelia, 1,950 meters altitude, population 37,278, is one of the richest and most beautiful regions of the Republic.

Boundaries.—Its boundaries are Guanajuato on the north, México and Querétaro on the northeast, Guerrero and Colima on the southeast, Jalisco on the west, and the Pacific Ocean on the south. The State measures 55,693 square kilometers.

Topography.—The general character of the State is mountainous, and it is immensely rich in vegetation. The coast line, which is generally low, measures 163 kilometers in extent. The Sierra Madre Mountains traverse the State, sloping down, in the southern part, to the basin of the Balsas River, and continuing their course on the farther

bank of the river as the Sierra Coalcomán. Other ranges are Ozumatlán, Tajimaroa, Zitácuaro, Angangisco, and Tlalpujahua. The highest peaks are Tamtitado, 386 meters; Patambán, 3,750; Chincéo, 3,324; Tarimangacho, 3,104; Zirate, 3,340; San Andrés, 3,282; the volcano of Jorullo, 1,299, and several others of lesser importance.

Hydrography.—The principal rivers are the Lerma, which irrigates the upper region of the State, running east and west, and, after receiving the waters of several affluents, finally empties into Lake Chapala; the Duero, flowing from southwest to northwest, and the Balsas, called also Zacatula and Atoyac, which flows from east to west, and has several tributaries. The Lake of Chapala, 1,580 square kilometers in extent, is on the Jalisco boundary, one-sixth of it belonging to the State of Michoacán. In the same region are the lagoons of Tacáscuaro and Magdalena. The Lake of Pátzcuaro, 36,090 meters long and 31,508 in breadth, contains five small islands, three of which are inhabited. Other bodies of water lying within the State limits are Lake Cuitzéo, the lagoon of Zirahuen, and of Zipimeo.

Climate.—All varieties of climate are found in the State, the cold in the high altitudes being most intense, while the northern portion is temperate and healthy, the heat increasing toward the south, where fevers are prevalent.

Fauna and flora.—The fauna of the State is rich and varied, the different species equaling in number those of other portions of the Republic. The same is true in regard to the flora.

Resources.—The principal agricultural products are cereals, canary seed, sesame and linseed, coffee, vanilla, rubber, tobacco, sugar cane, fruits of all kinds, and cabinet woods. Production, according to official data, was as follows in 1902: Cereals to the value of about $8,000,000, the principal items being corn, $4,865,000, and wheat, $2,500,000; sugar-cane products to the amount of 21,000,000 kilos, valued at $3,100,000; alcohol, $758,000; maguey products, $285,000; coffee, $93,000, and tobacco, $64,000. The annual valuation of agricultural products varies from 15,000,000 to 16,000,000 pesos. The stock value of the State is calculated at about $10,000,000, in the following order: Beef cattle, sheep, horses, hogs, goats, mules, and asses.

Mining.—Michoacán is one of the richest mining sections of México, gold, silver, copper, iron, cinnabar, lead, sulphur, copperas, marble, granite, and coal being among the minerals found in abundance. The number of registered claims on December 31, 1902, amounted to 417, covering an area of 10,064 hectares, while the total mineral production of the State is estimated at 34,000,000 kilos, valued at $1,200,000, there being 56 mines in operation.

Trade.—Commerce is one of the leading industries, the principal articles of trade being cereals, exported to the neighboring States of Guanajuato, San Luis Potosí, Querétaro, and to México City; coffee

to Germany and the United States and México City; fruits to the United States and to Querétaro and Guanajuato. Foreign trade is carried on through the ports of Veracruz and Manzanillo and the frontier customs ports of Paso del Norte and Nuevo Laredo. The total trade of the State may be estimated at about $30,000,000. The gold and silver mined is sent to the mint at México for coinage.

Communications.—The line of the Mexican National Railroad, from Pátzcuaro to the City of México, traverses the State for an extent of 439 kilometers. It is also crossed by the Mexican Central, and concessions have been granted for two other roads. Three street-car lines are in operation, while there are good telegraph, telephone, and mail facilities, and some very good wagon roads. A steel steamboat navigates Pátzcuaro Lake.

Industries.—The manufacturing industries are confined mainly to the production of cotton and silk shawls, cotton and woolen goods, palm hats, lace and embroideries, sugar-cane products, pulque mescal, cheese, wax matches, and beer. Sericulture and the culture of olive trees and grapevines are being introduced.

Divisions.—The State is divided into 15 districts, subdivided into 75 municipalities, the districts being as follows:

Piedad, population 64,936; its chief town, Piedad Cabados, is an important one, situated near the station of the Central Railway, 181 kilometers from Morelia, the capital of the State.

Puruándiro, population 92,871; its chief town, Puruándiro de Calderón, the third city in the State from an industrial and commercial standpoint, is 86 kilometers from Morelia.

Morelia, population 136,760; its chief town, bearing the same name, is also the capital of the State, with 37,278 inhabitants. It has a number of fine public buildings, an aqueduct, several factories, a public library, and a museum. It is situated on a picturesque hill, about 377 kilometers from México City, and has tramway lines connecting it with the station of the Central Railway.

Zinapécuaro, population 56,041; its chief town, Zinapécuaro de Figueroa, is 54 kilometers from Morelia and 7 from Huingo Station, on the Mexican National Railroad.

Maravatío, population 53,583; its chief town, bearing the same name, is 154 kilometers from Morelia.

Zitácuaro, population 65,624; its chief town, Zitácuaro de la Independencia, is 155 kilometers from Morelia on the line of the Michoacán road.

Huétamo, population 48,443; its chief town, Huétamo de Nuñez, is 252 kilometers from Morelia.

Tacámbaro, population 40,697; its chief town, Tacámbaro de Codallos, is 93 kilometers from Morelia.

Ario de Rosales, population 42,831; its chief town, bearing the same name, is 88 kilometers from Morelia.

Apatzingán, population 26,461; its chief town, Apatzingán de la Constitución, is 241 kilometers from Morelia.

Coalcomán, population 17,065; its chief town, bearing the same name, is 423 kilometers from Morelia.

Uruapán, population 80,250; its chief town, Uruapán del Progreso, is 125 kilometers from Morelia. The coffee from this district is valued very highly both in the Republic and abroad. The production is, however, very small.

Jiquilapán, population 59,938; its chief town, bearing the same name, is 245 kilometers from Morelia.

Zamora, population 92,150; its chief town, bearing the same name, is 128 kilometers from Morelia.

Pátzcuaro, population 52,403; its chief town, of the same name, lies near the beautiful lake of Pátzcuaro, 62 kilometers from Morelia.

MORELOS.

The State of Morelos, population 160,115, capital Cuernavaca, 1,542 meters altitudes, with a population of 9,584, is a small but rich and progressive State.

Boundaries.—Its boundaries are the Federal District to the north; the State of México on the west, northwest, and northeast; Puebla on the east and southeast, and Guerrero on the south and southeast. Its area is 7,082 square kilometers.

Topography.—The topograpical conditions are varied, embracing high mountain ranges, snow-capped volcanoes, beautiful valleys, and deep ravines. The northern part is the mountainous section. There rises the lofty Sierra de Ajusco, while the Huitzilac, Tepoctlán, and Santo Domingo ranges extend from west to east until they meet the Tlayacapon mountains. The highest peaks in these ranges are Yepac, Ololuica, and Ocotecatl. In the northeast are the Popocatepetl and the Ixtacihuatl ranges, while other mountain chains cross the State in all directions.

Hydrography.—The State may be said to belong to the basin of the Amacusac River, which traverses it from west to east. This river is formed by the junction of the San Jerónimo and Chontalcuallán and receives a large number of tributary streams, among them the Chalma, Alpuyeca, Tepalcapa, Yautepec, Jojutla, Tlaquiltenango, and Cuautla rivers. The principal lake is Lake Tequesquiten, which occupies the site of the old town bearing the same name, and which, by reason of a subsidence of the ground, due to frequent inundations, was engulfed about half a century ago by the waters used in irrigating the land. The church spire may yet be seen in the middle of the lake. Others are the Miacatlán and Hueyapán lakes. Mineral hot springs abound.

Climate.—The climate is hot in the southern and central regions, cold in the northern or mountainous portions, and temperate on the mountain slopes. Rainfall is moderate throughout the territory with the exception of the slopes of the northern mountains, where it is very abundant. Frosts are of infrequent occurrence. The prevailing diseases are malarial and typhus fevers and affections of the respiratory and digestive organs.

Fauna and flora.—Both fauna and flora are rich and varied, embracing the same species indigenous to other States of the Republic.

Resources.—From an agricultural standpoint, Morelos is one of the richest States in México. The principal products are sugar cane, rice, corn, coffee, wheat, and garden vegetables. The first cane plantation and sugar mill in México was established by Cortés in Tlaltenango, and since that time its culture has advanced steadily and continuously, it being now the leading article of production of the State of Morelos. Rice yields at the rate of 200 kilograms for 1 kilogram of seed; corn, 100 to 200 hectoliters for 1 hectoliter sown, and other products render adequate returns for their culture. The State's agricultural production, according to official figures for 1902, was as follows: Cereals, $1,600,000; sugar-cane products, except rum, 64,791,000 kilos, valued at $9,035,500; rum, 49,000 hectoliters, at $1,170,250; maguey products, few $13,000. The extent of coffee culture is indicated by the fact that a years ago 1,000,000 trees were planted. Stock raising does not receive much attention, the total value of all kinds, including beef cattle, sheep, and goats, being $1,250,000.

Mining.—Mining occupies an inferior position among the industries of the State, although within its territory are found silver, galena, marble, alabaster, cinnabar, iron, gold, lead, petroleum, and coal.

Trade.—Morelos is an important mercantile center, not only on account of its proximity to the Federal District, but also by reason of its immense sugar-cane interests. The Interoceanic Railroad does not suffice for the traffic in these products, the supplementary use of mule paths being also found requisite for their conveyance to México City. About $3,000,000 is the calculated annual export value of cane products, such as sugar, rum, and molasses. Fruit exports figure at about $1,000,000, and other products, including corn, coffee, mescal, etc., about $100,000. Imports may be estimated at about $2,000,000, and include alimentary products, furniture, clothing, books, implements, arms and ammunition, and hardware.

Communications.—The Interoceanic Railway traverses the State from northeast to southwest, having seven stations in its extent of 76 kilometers. A concession has recently been granted for a line between Toluca and Cuernavaca, and there is a prospect for the Valley Railway being extended to the latter city. Good wagon roads exist and telegraph, telephone, and mail service is efficient.

Industries.—The manufacturing industries, in addition to the development of cane products, include the preparation of mescal, and the manufacture of beer, flour, chocolate, oils, cigars, bricks, tiles, hair bridles and halters, ixtle bags, and cotton goods. Pottery works and tanneries also make good returns.

Divisions.—The State of Morelos is divided into 6 districts, subdivided into 26 municipalities, as follows:

Cuernavaca, population 40,813; its chief town, bearing the same name, is also the capital of the State, on the river Tepeyte, 76 kilometers from the City of México. Cuernavaca is a justly celebrated health resort, much visited by natives and tourists on account of its salubrious climate. It is an important commercial center, possessing very fine public buildings, among others the Palace of Cortés, where the State Legislature meets, a Meteorological Observatory, and the public library. The population of the capital numbers 9,584 inhabitants.

Yautepec, population 18,336; its chief town, Yautepec de Zaragoza, is 25 kilometers from Cuernavaca and 161 kilometers from the City of México, with which it is connected by the Interoceanic Railway.

Morelos, population 30,055; its chief town, Cuautla Morelos, is 44 kilometers from Cuernavaca, and is connected with the capital of the Republic by rail.

Jonacatepec, population 26,595; its chief town, Jonacatepec de Leandro Valle, is 74 kilometers from Cuernavaca.

Juarez, population 20,233; its chief town, Jojutla de Juarez, is 50 kilometers from Cuernavaca, and is connected with the City of México by rail.

Tetecala, population 24,083; its chief town, Tetecala de la Reforma, is 48 kilometers from Cuernavaca.

NUEVO LEON.

The State of Nuevo Leon, population 327,937; capital city, Monterey, 495 meters altitude, population 62,266, occupying a very fertile and well-watered region, abounding in minerals.

Boundaries.—The boundaries are Coahuila on the north, northwest, and west; San Luis Potosí on the south and southwest, and Tamaulipas on the northeast, east, and southeast. Nuevo Leon, whose area is 61,343 square kilometers, occupies the eastern slope of the central plateau, extending in a northeasterly direction.

Topography.—The Sierra Madre Mountains traverse the State at a mean elevation of 1,676 meters above sea level for a distance of 252 kilometers. Among its numerous peaks, the Potosí is the principal, its summit being covered with snow during part of the summer. These mountains come to an abrupt end in the northern part of the

AMACUSAC VALLEY, STATE OF MORELOS.

State; here another chain starts whose highest peaks are known as the Silla, Mitra, Topo, and Salinas. At the latter point the chain is bifurcated, forming two new ranges, viz, the Sierra de Gomas on the north and the Sierra de Picachos on the south.

Hydrography.—Twelve rivers and 100 smaller streams irrigate the State, besides numberless brooks. None of these water courses, however, are navigable. The principal river is the Salado, its waters abounding in fishes and fine pearl oysters. It receives the waters of many tributaries and flows from west to east, emptying in the Rio Bravo. The Santa Catarina, the Ramos, the Pilón, the Rio Grande de San Juan, the Potosí, the Hualahuises, and Pablillo rivers follow in the order mentioned. There are also two lagoons and several hot springs, but no lakes.

Climate.—The climate varies according to the altitude, but it is generally temperate and healthy, the extreme of heat being found in the north and east where the land is low, while on the highlands of the south a moderate temperature prevails, varying in the Sierra Madre Mountains according to the altitude. The rainfall is variable, and winds come in general from the east and northeast.

Fauna and flora.—The fauna and flora of the State possess the same qualities and extent as other Mexican States.

Resources.—Agriculture has been steadily progressing. The Mexican Statistical Annual for 1902 credits the State with the following production in round figures: Cereals, $1,108,000; sugar-cane products, rum excepted, 8,559,000 kilos, valued at $940,000; rum, $36,250; maguey products, $14,000; ixtle, $34,000. The value of stock in the State is estimated at $6,000,000, the different varieties classed as follows: Goats, sheep, beef cattle, horses, hogs, asses, and mules.

Mining.—The mineral wealth of the land has been very slightly developed, although there exist mines of iron, copper, silver, lead, coal, sulphur, marble, etc. On the 31st of December, 1902, the number of registered claims was 509, covering an area of 9,704 hectares, the total output of the State being estimated at 151,412,839 kilos, with a value of $2,427,000, the number of mines in operation being 60.

Trade.—Among the exports may be mentioned shipments of cattle to Texas (United States) and to some Mexican States, also agricultural products and a small quantity of cotton and woolen goods. The mercantile movement may be estimated at about $15,000,000 per annum. Imports include clothing, textile fabrics, hardware, drugs, paper, wines and liquors, coffee, tea, machinery, implements, arms, etc., estimated at a value of about $8,000,000 per annum.

Communications.—The Mexican National Railroad crosses the State from west to northeast, having 31 stations in its course of 280 kilometers. The Montery and Gulf of México road crosses it from west

to south on its way to the State of Tamaulipas. A branch of the Mexican National, from Matamoros to Monterey is in process of construction. There are 20 kilometers of tramways, all starting from Monterey, also fine wagon roads in all directions. Telegraph, telephone, and mail service is efficient.

Industries.—In addition to the manufacturing industries connected with the sugar interests, there are three large cotton mills, also one for the manufacture of cloth and cassimeres, and several chocolate, rope, beer, and match establishments.

Divisions.—Nuevo Leon is divided into 48 municipalities, grouped as follows: Municipalities of the north, 17; of the east, 14; of the south, 13; of the west, 3, and of the center, 1.

The principal cities of the municipalities are:

Northern group:[a] Lampazos de Naranjo, population 8,586, on the Mexican National Railway, 154 kilometers from Monterey; Villaldama, population 6,440, on the same road, 94 kilometers from Monterey, and Sabinas Hidalgo, population 7,318.

Eastern group: Cadereyta Jimenez, population 18,040, on the Monterey and Gulf Line, 42 kilometers from the capital of the State, and Cerralvo, population 6,069, 125 kilometers from Monterey.

Southern group: Santiago, 12,655 population, 42 kilometers from Monterey; Montemorelos, population 18,443, on the Monterey and Gulf Line, 96 kilometers from the capital; Linares, population 19,363, the second city in the State, 180 kilometers from Monterey, and Doctor Arroyo, 22,350 population, 302 kilometers from Monterey.

Western group: García, population 5,107, which is the only large town in this section, situated on the Mexican National Line, 37 kilometers from Monterey. This portion of the State contains two large cotton mills, one at Garza García, with 17,740 spindles and 72 looms, producing from 15,000 to 20,000 pieces per annum, and another at Santa Catarina, population 4,383, whose output is estimated at 16,000 pieces.

Central municipality, or the municipality of Monterey, population 72,963, contains the capital of the State, Monterey, with 62,626 inhabitants, situated 975 kilometers from the City of México by wagon road and 1,079 by the Mexican National Line. Monterey is a handsome city, possessing very fine public buildings and all the conveniences of civilization. It is the first commercial city of the northern Mexican frontier, and is connected by rail with the principal cities of México and the United States. Among its industrial establishments are a blanket and cassimere factory, breweries, ice factories, foundries, sawmills, flour mills, chocolate, match, wagon, and carriage factories. There are three tramways, measuring 13 kilometers in length, that

[a] Only towns of 3,000 inhabitants or over are mentioned.

cross the city. It also possesses a bank and chamber of commerce. The Federal assay office during 1902 treated gold for export to the value of $842,715, and silver for over $10,700,000.

OAXACA.

The State of Oaxaca de Juarez, population 948,633, capital city Oaxaca, 1,546 meters altitude, population 35,049, is one of the most important sections of the Republic.

Boundaries.—Its boundaries are the States of Puebla and Veracruz on the north, Veracruz and a portion of Chiapas on the northeast and east, Chiapas and the Pacific Ocean on the south, and the State of Guerrero on the west and northwest. Its area is 91,664 square kilometers.

Topography.—Oaxaca occupies a beautiful and fertile region, irrigated by a number of rivers and lesser streams which traverse the numerous valleys. The Sierre Madre Mountains cross the whole State, their ramifications extending throughout the territory, and forming such valleys as the Nochitlán or Mixteco, 2,111 meters above sea level. The maritime range, called Sierra del Sur, is composed of high mountains whose slopes are covered by virgin forests. The Zempoaltepec, 3,397 meters in height, is the starting point of the several ramifications of the Sierra Madre. The beautiful valley of Oaxaca or Antequera occupies the greater part of the central region, the San Felipe del Agua peak, 3,125 meters above sea level, representing its highest altitude. Other mountain tops vary in height from 1,300 to 2,275 meters. The Isthmus of Tehuantepec is traversed by the Tarifa and Chimalpa mountains.

Oaxaca is one of the maritime States of México bordering on the Pacific Ocean, and has a coast line of 410 kilometers. These shores are low and sandy. The natural ports are Chacahua, Puerto Escondido, Puerto Angel, San Augustín Huatules, San Diego, La Ventosa, and Salina Cruz, the latter being the starting point of the international railroad that is to connect the Pacific Ocean and the Gulf of México. Salina Cruz is an open port with a deep harbor, where the largest vessels may safely anchor. Puerto Angel is a sheltered port, quite deep, but too narrow to permit the passage of large vessels. These are the only ports open to foreign and coastwise traffic. There are numberless bays, bars, roads, and a few islands. The Gulf of Tehuantepec is one of the most important in the Republic, being about 210 kilometers in length from east-southeast to west-northwest, and 55 kilometers from north to south, and affording numerous ports, roads, harbors, and places of anchorage.

Hydrography.—Most of the streams irrigating the State can not be properly called rivers on account of their short courses. The principal ones, all draining into the Pacific, are: The Atoyac, 293 kilometers

in length, receiving the waters of numerous tributaries; the Tehuantepec, which, with its numerous tributaries, traverses an extent of 294 kilometers, and the Arena or Pinotepa, the Tonameca, and Copalita. The principal lakes are the Superior and the Inferior, both in the Isthmus of Tehuantepec, Alotengo, and Chacahua, all communicating with the Pacific Ocean.

Climate.—The climate is generally hot and unhealthy on the seacoast and lowlands adjacent to the State of Veracruz, temperate in the valley of Oaxaca and on the mountain slopes, and cold in the higher altitudes and throughout almost the whole region of the Mixteca Alta. Rainfall is moderate in the State and frosts are of infrequent occurrence. Fevers and affections of the digestive organs are most prevalent, yellow fever occurring principally on the coast.

Fauna and flora.—The fauna and flora of the State present the same general features as in the other parts of the Republic.

Resources.—The principal agricultural products of the State during the year 1902 are officially given as follows: Cereals, about $8,000,000; sugar-cane products (direct), 10,666,000 kilos, valued at $1,308,000; rum, $1,221,900; maguey products, $222,000; textile fibers, $100,000; coffee, $503,000, and tobacco, $60,000. The yearly agricultural production of the State may be estimated at about $15,000,000. Stock raising represents a value of about $4,000,000, the leading species being sheep, goats, beef cattle, hogs, and horses.

Mining.—From a mining standpoint Oaxaca is immensely rich, but so far its wealth has not been properly exploited. The principal minerals found are silver, gold, iron, lead, coal, marble, and salt. The number of claims registered during 1902 was 875, covering an area of 6,880 hectares. The number of mines in operation during the same period was 45, with a total output, according to official figures, of about 15,000,000 kilos, valued at $1,012,271.

Trade.—The State maintains an active trade with the States of Veracruz, Puebla, and Chiapas, and sends its coffee, hides, cochineal, flour, sugar, minerals, indigo, oils, tobacco, and other products both abroad and to other parts of the Republic. The list of foreign imports embraces about 200 articles, the principal being machinery, agricultural implements, hardware, canned goods, beer, wines and liquors, cotton, woolen and silk goods, etc. The ports of Salina Cruz and Puerto Angel are maritime customs ports, their trade during the fiscal year 1901–2, according to the "Boletín de Estadística Fiscal," being estimated at $100,000 for imports and $414,000 for exports. The entire trade of the State is calculated at from 16,000,000 to 18,000,000 pesos.

Communications.—The Southern Mexican Railroad runs from Puebla to Oaxaca on its way to the Guatemalan frontier, with a branch line to Puerto Angel. The Interoceanic runs from Salina Cruz on the Pacific to Coatzocoalcos, on the Gulf of México, a distance of 304 kilometers.

The city of Oaxaca contains good tramways. The State is also in communication with the adjacent States by means of high roads, telegraph, and mail routes, there being also an efficient telephone service. Maritime communication by the ports of Salina Cruz and Puerto Angel is carried on by the Pacific Mail Steamship Company, the Hamburg-American Line, and the Mexican Line "Pacific and Gulf of California." There is also a line of steamers, owned by a Mexican company, navigating the river Papaloápam, and plying between Tlacotalpam (Veracruz) and Tuxtepec.

Industries.—The industries of the State are agriculture and the extraction of the maguey fiber, called *pita de Oaxaca*, as well as the manufacture of woolen and cotton fabrics, furniture, pottery, candles, soap, matches, chocolate, and tobacco.

Divisions.—The State is divided into 26 districts, subdivided into 463 municipalities, which according to their geographical position are grouped as follows:

Northern: Silacayoápam, population, 29,133; Huajuápam, 45,043; Teposcolula, 32,814; Coixtlahuaca, 17,195; Teotitlán, 36,556; Cuicatlán, 23,864, and Tuxtepec, 37,745; their principal towns being Silacayoápam, 277 kilometers from Oaxaca; Huajápan de Leon, 202 kilometers from Oaxaca; Coixtlahuaca, or Villa de Libres, 120 kilometers from the capital of the State, and Tuxtepec, 260 kilometers from Oaxaca.

Eastern: Villa Alta, population, 44,223; Choapám, 14,128; Tehauntepec, 34,948, and Yautepec, 25,245; the principal towns being Villa Alta, Choapám Santiago, Yautepec, and Tehauntepec, population 10,386, the latter being the second city in the state, on the line of the Isthmian Interoceanic road, 294 kilometers from Oaxaca and 21 from the port of Salina Cruz, and is a fine, progressive town.

Southern: Juchitán, population, 52,182; Miahuatlán, 42,947; Pochutla, 22,847; Juquila, 23,769, and Jamiltepec, 49,304, their principal cities being Juchitán, or Ciudad de Zaragoza, near the Interoceanic road; Miahuatlán, Pochutla, near Puerto Angel; Juquila, and Jamiltepec.

Western: Tlaxiaco, population, 69,460, and Juxtlahuaca, 21,139, with their principal towns Heroica Tlaxiaco, an important industrial town, and Juxtlahuaca or Villa Albino Zertuche.

Central: Centro, population 72,024; Nochixtlán, 42,447; Villa Alvarez or Zimatlán, 48,244; Ejutla, 25,107; Tlacolula, 42,124, and Ocotlán, 34,066, the chief town of which is Oaxaca de Juarez, situated in the Centro district and capital of the State, with 35,049 inhabitants. It is 464 kilometers from México City, 340 from Puebla, and 464 from Veracruz. This is one of the handsomest and most advanced cities in the Republic, containing fine public buildings, tramways, and equipped with all modern conveniences. It is also the leading industrial and

commercial center of the State. Other towns are Etla de Santiago, Nochixtlán Asunción, Villa Alvarez or Zimatlán, Heroica Ejutla Crespo, Tlacolula de Matamoros, and Villa de Morelos or Ocotlán de Santo Domingo.

PUEBLA.

The State of Puebla has a population of 1,021,133, its capital city, at an altitude of 2,162 meters, bearing the same name.

Boundaries.—The State is bounded on the north and east by Veracruz, on the south by Oaxaca and Guerrero, and on the west by Morelos, México, and Hidalgo, its area being 31,616 square kilometers.

Topography.—The general topographical aspect is mountainous, the principal peaks being Popocatepetl and Ixtatzihuatl, the volcanoes of San Andrés and Perote, and the mountain ranges Huauchinango, Zacatlán, Zacapoaxtle, Tezuitlán, and Mixtecas. The most important plains are San Juan de los Llanos, Chalchicomula, Tecamachalco, Tepeaca, Tepeji, and the principal valleys those of Texuclucán, Atlixco and Puebla.

Hydrography.—Among the rivers may be named the Atoyac and its tributaries, the Vinasco, Pantepec, Cazones, Zempoala, and Mecaxa, the latter forming, in the district of Huauchinango, a beautiful cascade 162 meters high. There are four lakes, called Quecholac, Tlachichica, Epatlán, and Tepehuayo.

Climate.—The climate shows varying degrees of temperature, being temperate on the plains, hot in the south, and cold in the northern districts.

Fauna and flora.—The fauna and flora present the same general characteristics peculiar to other States of the Republic.

Resources.—Agriculture is the leading industry, the chief products being cereals, sugar cane, coffee, vanilla, and delicious fruits of all kinds. Official figures for 1897 credit the State with 483 plantations, divided as follows: Three hundred and twenty-eight devoted to cereals, 67 to sugar cane, 26 to maguey pulque, 14 to coffee, 6 to tobacco, and 42 to cattle raising. The production for 1902 is given, officially, as follows: Rice, 2,112,625 kilos at $109,019; barley, 595,517 hectoliters at $1,328,180; corn to the value of $6,332,746, and wheat $1,912,473; sugar cane products (direct), $3,044,613; rum, $820,000; maguey products, $475,000; textile fibers, $14,000; coffee, $223,000; tobacco, $57,260; vanilla, $21,000.

Mining.—The principal minerals found are gold, silver, and copper, marble also existing in large quantities. During the year ending December 31, 1902, there were 152 mining claims registered, covering an area of 1,967 hectares. The output of 14 mines in operation during the same period is officially given as 47,604,000 kilos, with a value of $600,000.

Trade.—The commerce of the State is characterized by the same

MUNICIPAL PALACE, CITY OF PUEBLA, STATE OF PUEBLA.

features as that of other States of the Republic, the exports consisting principally of agricultural products, and the imports of manufactured articles of common utility.

Communications.—In addition to several wagon roads, the means of intercommunication in the State consist of a branch line of the Mexican Railroad from Puebla to Apizaco; the Interoceanic, connecting the State capital with the City of México, and the Matamoros line. Telegraph, telephone, and mail services are efficient.

Industries.—The manufacturing industries are similar in the main to those of the other Mexican States.

Divisions.—The State is divided into 21 districts, subdivided into municipalities. Geographically the districts may be grouped as follows:

Northern group: Embracing Alatriste, population, 32,366; Huauchinango, 70,312; Tetela, 34,564; Tezuitlán, 31,017; Tlatlauquitepec, 21,792; Zacapoaxtla, 32,853; and Zacatlán, 65,962; their principal cities are Chiguanapám, Huauchinango, Xicotepec, Tetela, Tequitlán, Tlatlanqui, Zacapaxtle and Zacatlán.

Central group: Atlixco, population, 53,304; Cholula, 49,231; Huejotzingo, 49,325; San Juan de los Llanos, 32,168; Chalchicomula, 70,984; Puebla, 109,432; Tecali, 28,860, and Tepeaca, 42,656. The principal towns are Atlixco, which is an important town on the Matamoros and Puebla Railroad, containing some fine public buildings, cotton mills, and other industrial establishments; San Pedro Cholutla, Huejotzingo, on the Interoceanic line; San Pedro de los Llanos, on the same line; San Andrés Chalchicomula, on the Mexican Railway; Tecali, Tepecaca, and Puebla, the capital, containing 93,521 inhabitants. This latter is one of the oldest and most important cities of the State, possessing many handsome buildings, among others the Cathedral and several churches, the State college, containing over 24,000 volumes; the Palace of Justice, the School of Medicine, and the "Palafoxiana" Library, with more than 100,000 volumes; the Palace of Congress, the Episcopal Palace, several hospitals, the Academy of Fine Arts, a chamber of commerce, and branches of the Banco Nacional, Banco Oriental, and the Banco de Londres y México, and three theaters. The city is one of the most important in the Republic by reason of its commerce and industries, possessing several cotton and woolen mills, glass factories, and other establishments.

Southern group: Acatlán, population, 46,364; Chiautla, 38,807; Matamoros, 37,573; Tehuacán, 78,129; Tepexi, 47,533, and Tecamachalco, 47,901; the principal towns of which bear the same names.

QUERÉTARO.

The State of Querétaro-Arteaga, population 232,389, whose capital city is Querétaro, 1,836 meters above the the sea, population 33,152

is one of the smallest in the Mexican Republic, rich in minerals, well irrigated, and prosperous.

Boundaries.—Its boundaries are San Luis Potosí on the north, Hidalgo on the east and northeast, México to the southeast, Michoacán on the south, and Guanajuato on the west. The area is estimated at 11,638 square kilometers.

Topography.—Topographically the State may be divided into two regions, the northern portion being mountainous, the ranges extending toward the center, while the central and southern sections are occupied by plains and valleys. In the north are the Sierra Gordo Mountains, running from west to east, these mountains being also known as the Sierra de Querétaro. Among the peaks are the Cerro Alto, Cerro Colgado, Cerro del Campanario, Pilón, Santa Rosa, Cimatario, Minteji, and the historic Cerro de las Campanas, where Maximilian, Miramón, and Mexía were shot.

Hydrography.—Querétaro is irrigated by a large number of rivers and smaller streams, the principal being the Concá or Jalpán, emptying into the Ayutla; the Extoraz, the Moctezuma, the Galinda, Querétaro, Juriquilla, and their tributaries. There are several small lakes, the principal being Cerro Grande, Concá, Sancillo, and Saledón; also many swamps and mineral springs.

Climate.—Climatic conditions vary with the altitudes. Rainfall and frosts are moderate, and the winds are variable. The prevailing diseases are malarial and other fevers; also affections of the respiratory and digestive organs.

Fauna and flora.—The fauna and flora possess the same general characteristics as do those of the other Mexican States, being varied and abundant.

Resources.—The State of Querétaro occupies a very fertile region, producing all kinds of cereals, leguminous plants, fruits, etc., so that agriculture is the principal industry. Cotton, sugar cane, and wheat are also cultivated, the latter yielding 100 grains to the seed and being considered the best in the Republic. In 1897 the number of plantations in the State were, according to official figures, 195; of which 179 were devoted to the culture of cereals, 9 to maguey mescal, 2 to sugar cane, and 5 to cattle breeding. The yearly product of these industries was estimated in the following values for 1902: Cereals, $2,952,165; maguey products, 18,000 hectoliters, at $68,800; ixtle, 41,290 kilograms, at $5,294, and tobacco, $1,500. Stock may be estimated at a value of about $2,500,000.

Mining.—Minerals abound throughout the entire State, Cadereyta and Tolimán being the richest mining regions. The principal products are silver, galena, copper, iron, cinnabar, mercury, coal, and lead, while among the precious stones are opals, garnets, and similar deposits. There are 59 mines in the Cadereyta district, 8 in Tolimán,

and 35 in Jalpán. There are over 20 establishments for the reduction of ores, all of which, however, are not in operation. Official data for 1902 give the number of claims registered to December 31, at 119, covering an area of 1,877 hectares, while the number of mines in operation at that date was 14, the output being estimated at 4,327,000 kilos with a value of $150,000.

Trade.—The trade of the State may be estimated at from 9,000,000 to 10,000,000 pesos per annum. This is carried on principally with the neighboring States, corn, wheat, and other cereals, fruits, jerked beef, etc., being sent thither, and mineral products shipped to the United States. The imports follow the same general line as the imports of the other Mexican States, most of them coming from the United States, Europe, and México City, and are estimated at a value of about $5,000,000, exports being calculated at $4,000,000.

Communications.—The Mexican Central Railroad traverses the State from southeast to west for an extent of 95 kilometers, and has several stations. The various districts also are crossed by tramways, and good wagon roads are abundant, the mail, telegraph, and telephone services being especially efficient.

Industries.—In addition to agriculture and mining, such industries as linen, woolen, and cotton-goods manufactories, flour mills, distilleries, breweries, paper mills, etc., flourish.

Divisions.—The State is divided into 6 districts, subdivided into municipalities. The districts are:

Jalpán, population 35,096, which is a rich mining section, and whose principal town is Jalpán, situated 127 kilometers from the capital of the State, Querétaro.

Cadereyta, population 26,082, the richest mining district of the entire State; the chief town, Cadereyta Mendez, is 76 kilometers from Querétaro.

San Juan del Río, population 40,517; its chief town, bearing the same name and having a population of 8,224, is situated 59 kilometers from Querétaro, on the Central Railroad, and is the second city of the State. A line of street cars traverses the town.

Tolimán, population 28,017; its chief town Tolimán, or San Pedro de Tolimán, 117 kilometers from Querétaro, is noted for its opals.

Querétaro, or Distrito del Centro, population 79,385, the chief town of which is Querétaro, 1,836 meters above the sea, also the capital of the State, situated 246 kilometers from the City of México, and containing 33,152 inhabitants. Besides its great commercial importance, this city is perhaps the most interesting, historically, in México, having been the cradle of Mexican independence, the residence of the Executive during the war with the United States, and the place where the peace treaty was signed in 1848; also the last refuge of Maximilian and the place of his execution. The principal buildings are the Fed-

eral Palace, the Government Palace (both built of basalt), the Municipal Palace, the custom-house, the cathedral and other churches, several hospitals, the historic "Iturbide" Theater, a bank, a chamber of commerce, and the bull ring. An excellent aqueduct, 8 kilometers in length, furnishes the supply of water, and several cotton and woolen mills, and other industrial enterprises are in a flourishing condition. The town next in importance in the district is Hercules, notable on account of the Hercules Mills, the largest textile factory in the Republic.

Amealco, population 23,292, with a chief town of the same name situated 67 kilometers from Querétaro.

SAN LUIS POTOSÍ.

The State of San Luis de Potosí, population 575,432, or 9.25 inhabitants per square kilometer, the capital of which is the city of the same name, at an altitude of 1,877 meters, and a population of 61,000, is one of the important sections of the country.

Boundaries.—The State lies between 22° and 25° north latitude and is bounded on the north by the State of Coahuila; on the east by the States of Nuevo Leon, Tamaulipas, and Veracruz; on the southeast by the State of Jalisco; on the south by the States of Hidalgo, Querétaro. and Guanajuato, and on the west by the State of Zacatecas. The Tropic of Cancer passes through the northern part of this State at a point about 23 kilometers to the south of the famous mining district of Catorce.

Climate.—The climate is mild. It varies somewhat according to the elevation, cool weather occurring in the higher altitudes during the winter months, and warm weather prevailing at all seasons of the year in the lower ones.

Topography.—The State is traversed from north to south by the Sierra Madre range and is very mountainous, especially in the eastern portion. The central and western parts consist of the elevated table-land, which extends from north to south through that portion of the Mexican Republic. The greater part of this table-land is exceedingly dry, but where water can be obtained for irrigation purposes the soil proves to be fertile and productive.

Hydrography.—The southeastern portion is well watered and contains numerous running streams, some of them of considerable volume and importance. The principal rivers are the Tantojón and Tamuin, which flow into the Panuco River.

Fauna and flora.—The fauna and flora of the State of San Luis Potosí are in all respects as rich and varied as those of any other Mexican section.

Resources.—Agriculture, stock raising, and mining are the principal resources of the State, agricultural products being exceedingly varied.

and, where properly irrigated, the rich soil produces abundant crops. According to Mexican official statistics, San Luis Potosí contained, in 1897, 196 large plantations, 3 of which were devoted exclusively to the cultivation of coffee, 39 to sugar cane, 139 to cereals, and 15 to the products of the century or maguey plant. The "Anuario Estadístico" for 1902 credits the State with the following agricultural products: Cereals (rice, barley, corn, and wheat) to the value of $5,637,085; sugar cane products, rum excepted, 4,129,816 kilos, valued at $296,210; rum, 36,500 hectoliters, at $643,113; maguey products (mescal and pulque), 51,270 hectoliters, at $556,600; textile fibers (ixtle and cotton), 3,773,992 kilograms, valued at $546,000.

Stock raising in San Luis Potosí is in a flourishing and prosperous condition, and some authorities claim that it is the most important industry of the State, exceeding in value the agricultural industry. In addition to the large native herds which the State possesses, thousands of cattle are brought in annually from the neighboring States of Nuevo Leon, Coahuila, and Tamaulipas to graze and fatten upon the grassy plains of the table-lands and mountain slopes. When considered to be in a marketable condition, the beef cattle are separated from the herds, driven to the railway stations, and shipped to the City of México, and other large distributing centers of the Republic. There are some thirty large ranches in the State devoted exclusively to the raising of cattle.

Mining.—The mineral wealth of the State is very great. The great mining district of Catorce is famous the world over for its enormous deposits of silver ores. Immense quantities of high and low grade ores are taken from the rich mines of this district annually. Some of these mines have been worked more than fifty years without exhausting the supply of ore, and are still great producers. The argentiferous ores of this district contain a considerable percentage of lead, which adds to their value and desirability for smelting purposes. The immense output is shipped to the smelters at San Luis Potosi, Aguascalientes, and Monterey for treatment. A large number of other minerals are mined in different parts of the State. The principal mining districts are: Catorce, Matehuala, Cedral, San Luis Guadalcazar, and Salinas. Silver, lead, and copper ores are found in these districts in great abundance. Cinnabar is mined at Santa Maria del Rio, Guadalcazar, and Salinas; copper at Matehuala, and gold at Guadalcazar. The value of the annual silver production of the mines of the State is estimated at $3,000,000 Mexican silver. There are numerous salt deposits in this State, the largest and most important being situated at Peñon Blanco, on the Mexican Central Railway. The works at this place produce thousands of tons of fine salt annually. The number of mining claims registered to December 31, 1902, was 337, covering an area of 7,561 hectares, while the number of mines in operation during

the same period is officially given at 32, with a total output of 88,018,014 kilos, valued at $3,323,152. During the same year the Federal assay at San Luis Potosí treated gold and silver to the value of $39,000 for coining purposes, and to the value of $5,816,400 for export.

Trade.—The principal exports are to the United States, and consist of goatskins, bones for the manufacture of phosphorus, fruits from the Rio Verde region shipped to St. Louis, and cattle which are exported to Cuba.

Communications.—A branch of the Mexican Central Railway traverses the State from east to west. This branch line connects with the main line of the Mexican Central Railway at a point near the city of Aguascalientes, in the State of the same name. Its total length is 678 kilometers, about two-thirds of which is in the State of San Luis Potosí. This branch railway passes through San Luis Potosí, the capital of the State, and terminates at the port of Tampico, in the State of Tamaulipas. The main line of the Mexican National Railway crosses the State from north to south, placing both the State and city of San Luis Potosí in direct communication, via Laredo, Tex., with the United States. The Mexican National passes through the important cities of Monterey, State of Nuevo Leon; Saltillo, State of Coahuila, and the city of San Luis Potosí, terminating in the City of México, the capital of the Republic. The principal stations of the Mexican National in the State of San Luis Potosí are the city of San Luis Potosí, Venado, and Catorce. The Mexican Central Railway, in addition to passing through the capital of the State, runs through the important mining and commercial centers of Salinas, Guadalcazar, Cerritos, Cárdenas, and Valle. There are two other railway lines, both short. One extends from Matehuala to La Paz, a distance of 21 kilometers, while the other is known as the Vanegas, Cedral and Matehuala Railroad, and connects Vanegas, a station of the Mexican National Railway, with Matehuala, the length of the line being 47 kilometers. These two short railways penetrate one of the richest mining districts of the Republic, and transport annually thousands of tons of ore consigned to the different smelters of the State. Generally speaking, the State highways are good, but the roads which cross the mountains are mere trails and in many places are almost impassible.

Industries.—San Luis Potosí contains one of the largest furniture factories in the Republic. This factory is very complete and its products are to be found in many of the Mexican cities. Almost all the wood used comes from the United States. This seems unusual in a country so rich in cabinet woods, but it is owing to the fact that mahogany and the other fine woods of Tabasco and Chiapas can not be worked until they are seasoned, which takes considerable time. As

the shops of San Luis Potosí do not keep a sufficiently large stock on hand, they prefer to buy the seasoned wood in the United States. Walnut lumber is principally employed for the fine furniture. The other industries of the city are cotton-goods factories, tanneries, breweries, etc.

Divisions.—The State of San Luis Potosí is divided into thirteen districts, the name and population of each being as follows:

Name.	Population.	Name.	Population.
Catorce	70,899	Santa María del Río	38,257
Cerritos	30,792	Tamanzunchale	36,265
Ciudad del Maíz	31,172	Tancanhuitz	40,960
Guadalcazar	30,263	Valles	22,001
Hidalgo	44,094	Venado	32,792
Río Verde	41,517		
Salinas	12,319	Total	575,432
San Luis Potosí	144,101		

San Luis Potosí, the capital of the State, has a population of 61,019 inhabitants, and is located 1,887 meters above sea level. It is one of the principal smelting and commercial centers of the Republic. Hundreds of tons of ore are smelted daily in the large reduction works situated in the suburbs of this city. Thousands of workmen are employed in the handling of ores, and hundreds of thousands of dollars are paid out to them annually in the form of wages. The city contains many large and handsome public buildings, churches, and schools, and has one of the finest theaters in the Republic. It is a healthful community, the climate is salubrious, but little rain falls, and the atmosphere is clear and dry. The water supply is at present somewhat deficient, but steps are being taken for the construction of large reservoirs in the neighboring hills to remedy this defect. Considerable manufacturing is done at San Luis Potosí, the principal products being soap and candles, pottery wares, hats, paints, cigars and cigarettes, beer, etc. There is a chamber of commerce, a Federal assay office, three large banking institutions, and a Board of Trade.

In 1902 San Luis Potosí had 173 State and 162 municipal schools devoted to primary education. The Government also maintains several institutions of higher education, the principal school being the Scientific and Literary Institute, located at the capital of the State, which has an able corps of professors and is otherwise well equipped.

The other large towns of the State are shown in the following table:

Name.	Population.	Name.	Population.
Catorce	7,203	Santa María del Río	8,440
Cedral	6,333	Soledad Díez Gutierrez	5,730
Matehuala	14,205	Venado	5,750
Río Verde	5,759		

SINALOA.

The State of Sinaloa, population 296,701, whose capital city is Culiacán, 40 meters above the sea level, population 10,380, is one of the rich mining and agricultural sections of the Mexican Republic.

Boundaries.—It is bounded on the north by Sonora and Chihuahua, on the east by Chihuahua and Durango, on the south by the Territory of Tepic and the Pacific Ocean, and on the west by the Gulf of California. Its area is about 71,380 square kilometers, and its seacoast measures 510 kilometers.

Situation.—The Gulf of California extents along the coast of the State from Agiabampo Bay to the south of Mazatlán, at which point the Pacific coast line begins. Numerous bays and harbors are formed by the waters of the gulf, the principal being the bay of Topolobampo, on which is situated the port of the same name, generally considered to be the best on the Pacific coast by reason of its sheltered location. There are also the bays of Olas Altas, Mazatlán, Agiobampo, San Ignacio, Navachiste, and others indenting the litoral of the State, and forming small interior bays, in whose waters appear the islands of Mero, San Felipe, and Pájaros. Other islands along the coast are Saliaca, Altamura, Lobos, San Ignacio, Guinorama, Macapule, Cluendo, and Cuestión.

Topography.—The general topographical condition of the State is mountainous, the land rising gradually from the gulf coast to the Sierra Madre Mountains, which traverse Sinaloa north and south and constitute the principal range of the section. Others are the Sanabari Mountains, the Gacopira, Aguablanca, Cosalá, Guadalupe de los Reyes, Tasajera, Navachiste, Cuitaboa, and Tescalama. These systems embrace several peaks and plateaus.

Hydrography.—Sinaloa is one of the best irrigated sections of the Republic, many of its rivers, such as the Fuerte and Sinaloa, being navigable. Nearly all the streams rise in the Sierra Madre and empty into the Gulf of California, the principal being the Fuerte, 670 kilometers in length; the Sinaloa, 420 kilometers; the Moscorite, 108 kilometers; the Culiacán, 252 kilometers; the Quila, 156 kilometers; the Elota, 221 kilometers; the Piaxtle, 203 kilometers; the Presidio or Mazatlán, 167 kilometers; the Chametla or Rosario, 165 kilometers, and the Canoas or Telapán, 152 kilometers. These rivers all have numerous tributaries, and there are in addition over 200 smaller streams traversing the State.

Climate.—Climatically the State may be divided into two regions: The western, or hot belt, which is also the maritime section, devoted to agriculture, and the eastern, or cold belt, which is the mountainous district, devoted to mining. Rains are abundant on the coast, and in the mountains the precipitation is excessive, frost also being of frequent occurrence. Winds are variable, the northeastern predominating.

Fauna and flora.—The fauna and flora partake of the same characteristics as the majority of Mexican States.

Resources.—The principal agricultural products are cereals, cotton, tobacco, sugar cane, coffee, and fruits, their total valuation being about $8,000,000 per annum. According to Mexican official figures, in 1897 there were 121 plantations in the State, divided as follows: Cotton, 9; sugar cane, 20; cereals, 20; maguey mescal, 24; and 48 cattle ranches. The estimated value of these products for 1902 is as follows, in round figures: Cereals, $2,000,000; sugar-cane products (direct), 7,919,225 kilograms, at $1,575,900; mescal, $180,000; tobacco, $32,000; and ixtle, $30,000. Stock raising has an estimated value of about $9,000,000 a year.

Mining.—It is claimed that Sinaloa is the richest mining region of México, the standard of its production being higher than that of Guanajuato, Zacatecas, and Pachuca. The mining district lies in the east of the State, gold, silver, copper, iron, and lead being the principal metals. The number of mining claims registered in 1902 was 711, covering 5,903 hectares, while the total output of the State is estimated at 138,225,108 kilos, valued at $5,159,000. The number of mines in operation was 80. There are also rich salt deposits, mineral springs, etc. Culiacán Rosales contains fine reduction works and a mint.

Trade.—An active import and export trade is carried on through the port of Mazatlán, manufactured articles of all kinds being received in return for minerals and other native products. Altata and Mazatlán are the two customs ports. Imports in 1901–2 are valued at about $1,760,000, and exports, $7,214,000, while the total trade, including local traffic, amounts to from 18,000,000 to 19,000,000 pesos per annum.

Communications.—The Sinaloa and Durango Railway, also called the Western Mexican, has several stations between Altata and Culiacán de Rosales, and the International is constructing a branch line from Villa Lerdo (Durango) to Topolobampo, in addition to the Tepic road, which is to traverse the coast. There are tramways in the city of Mazatlán and many fine wagon roads connecting the principal towns with those of the adjacent States. Coastwise trade is carried on by several steamship lines, while the Pacific Mail and the Mexican International line furnish communication with foreign countries. The telegraphic, telephonic, and mail services are efficient and extensive.

Divisions.—The State is politically divided into 10 districts, subdivided into *directorías*, as follows:

El Fuerte, population 45,530, with a chief town of the same name, 230 kilometers from Culiacán, the State capital.

Sinaloa, population 43,432; its chief town of the same name is 160 kilometers from Culiacán.

Mocorito, population 28,628, the chief town of which, bearing the same name, is situated 22 kilometers from Culiacán.

Culiacán, population 44,344; its chief town, Culiacán Rosales, is also the capital of the State, containing 10,380 inhabitants and situated 1,478 kilometers from the capital of the Republic. This is an important commercial center, connected with the port of Altata by a railroad 62 kilometers in length, possessing very fine public buildings, among others the Government palace, the Mint, the total coinage of which for 1902 was gold to the value of $158,496 and silver $8,301,744, and the Cathedral. Cotton mills and other industrial establishments flourish. Next in importance is the city of Altata, a seaport having a large maritime movement. It is provided with a fine wharf, a powerful beacon light, and a custom-house.

Cosalá, population 21,399; its chief town, bearing the same name, is 151 kilometers from Culiacán.

San Ignacio, population 13,283, with a chief town of the same name situated 250 kilometers from Culiacán.

Mazatlán, population 38,298. The chief town, Mazatlán, population 17,852, is the first port of the Republic, situated 246 kilometers from Culiacán and 1,185 from the City of México. It is built on a small peninsula opposite the Bay of Olas Altas and contains a weather bureau, a fine custom-house, a chamber of commerce, three banks, and other public buildings, and a system of tramways. It is the foremost commercial and industrial Mexican town on the Pacific Ocean, the residence of several foreign consuls, and the touching point for the steamship lines above referred to.

Rosario, population 27,047; the chief town, bearing the same name, is 322 kilometers from Culiacán.

Concordia, population 17,817; the chief town, bearing the same name, is 299 kilometers from Culiacán.

Badiraguato, population 16,923; its chief town, of the same name, situated 76 kilometers from Culiacán.

SONORA.

The State of Sonora, population 221,682, the capital city of which is Hermosillo, 253 meters altitude, population 10,613, is one of the most northern of the Mexican States, and is on the United States border. In size it is the second State in the Republic, having an area of 198,496 square kilometers.

Boundaries.—Its boundaries are: On the north, Arizona and New Mexico (United States); on the east, Chihuahua; on the west, the Gulf of California, and on the south, Sinaloa.

Situation.—The State is washed by the Gulf of California for a distance of 860 kilometers, from the mouth of the Colorado River to the port of Agiabampo. This gulf is 1,190 kilometers in length and

306 in breadth, at its widest point. The Sonora littoral, which is low and arid, extends in a line almost parallel to Lower California, a peculiarity of the region being that the rain falls from a cloudless and serene sky. Several islands lie along the coast, among them being San Pedro Nolasco, San Pedro Martín, Tiburón, Patos, San Jorge, and Pelícano; as well as many capes, bays, etc. Guaymas is the principal gulf port of the State.

Topography.—In the east Sonora is traversed by the Sierra Madre Mountains, from which extend various ramifications forming beautiful valleys, ravines, and canyons. The principal of these secondary chains are the Sierras Guadalupe, San Luis, Batuco, Alamos, Antimez, Bacatete, and Prietas. The western portion is flat, and the largest valley is that of Guaymas.

Hydrography.—The principal rivers, all of which empty into the Gulf of California, are the Altar, also called Asunción and San Ignacio, 358 kilometers in length; the Yaguí, 838 kilometers; the Mayo, 293 kilometers; the Sonora, 410 kilometers, and the Mátope, 234 kilometers. There are other streams of lesser importance, and a lake, called San Rafael.

Climate.—The climate varies according to the altitude, is cold in the mountains, temperate on the slopes, and hot and dry near the coast and in the valleys. During the summer season the thermometer reaches 98° F. in Hermosillo, and in Guaymas it has gone as high as 119°. The minimum temperature for the winter months is 45°. Rainfall is moderate, and frost occurs occasionally in some districts, more especially in the Sierra Madre regions.

Fauna and flora.—The fauna and flora are remarkable for their wealth and variety, embracing the same species common to the rest of the country. The Gulf of California is noted for its fish and for its pearl oysters, the latter, it is claimed, yielding gems superior to those of the Gulf of Aden, in Asia.

Resources.—Notwithstanding the fertility of the soil, a lack of adequate irrigation facilities, in certain sections, is a drawback to agricultural development. The principal products are cereals, tobacco, cotton, sugar cane, fruits, etc. According to the official figures for 1897, the number of plantations in the State was 270, divided into: Sugar cane, 40; cereals, 179; fruits, 3; maguey mescal, 8; tobacco, 13, and 27 cattle ranches. The State's production for 1902, according to official figures, was as follows: Cereals to the value of $3,961,906; sugar-cane products, 200,000 kilograms, at $40,000; mescal, $710,000; tobacco, 238,557 kilograms, at $58,932.

At one time cattle were extensively exported to the United States, but owing to the high duties, almost prohibitory, imposed by that country this branch of commerce has decreased.

Mining.—Sonora is classed not only among the richest mineral-producing sections of México, but also of the world, the leading products being silver, lead, gold, copper, coal, antimony, iron, cinnabar, and graphite. Exports of these minerals to the United States are estimated at a value of from 10,000,000 to 12,000,000 pesos per annum. Although many of the mines are in exploitation, an equal number are lying idle. In the year ending December 31, 1902, the mining claims registered numbered 2,168, embracing an area of 35,894 hectares, while the total production of the 144 mines in operation during that period was 362,235,748 kilos, valued at $41,144,000.

Trade.—Owing to its geographical position all the foreign trade of the State is with the adjacent States and Territories of the American Union, while its home trade is carried on with Sinaloa, Chihuahua, and Lower California. The principal exports are metals and metallic ores, fruits, hides and skins, woods, etc., to the United States, wheat, flour, and cotton to Sinaloa and Chihuahua, pearls to Europe and the United States; and the principal imports are machinery and implements for mining and agriculture, silk, cotton, linen and woolen goods, wines and liquors, arms and ammunition, and hardware. The total trade of the State may be estimated as worth from 6,000,000 to 8,000,000 pesos per annum.

Communications.—The only railway traversing the State is the Guaymas and Nogales (Sonora) road, 422,302 kilometers in length, which, in Nogales (Arizona), connects with the Southern Pacific Railroad. The State has one street railway 3 kilometers in length, and the "Imuris Mining Company, Limited," owns another 18 kilometers long, and three concessions have been granted. Several fine wagon roads connect the different cities and towns with those of the adjacent States. Telegraphic, telephonic, and mail services are efficient and extended.

Industries.—The principal industries are mining, agriculture, and commerce. There are a few manufacturing establishments, such as cotton and woolen mills, soap and candle factories, and distilleries.

Divisions.—Sonora is divided into 9 districts, subdivided into municipalities. The districts and their chief towns are as follows:

Altar, population 13,229; chief town El Altar, 2.16 kilometers from Hermosillo. This district is rich in mines.

Magdalena, population 15,568; the chief town, of the same name, is 150 kilometers from Hermosillo. The second town in importance is Nogales, on the boundary line between México and the United States, separated from the American town of the same name by a street only. It is the terminal point of the Sonora Railway and has a customs port.

Arizpe, population 18,261, also rich in minerals; its chief town, of the same name, is 219 kilometers distant from Hermosillo.

Moctezuma, population 17,606, rich in mines; its chief town, Moctezuma or Oposura, is 185 kilometers from Hermosillo.

Sahuaripa, population 12,955, a mineral district; the chief town of which, of the same name, is 323 kilometers from Hermosillo.

Alamos, population 57,837, a mineral district, with a chief town of the same name, which is the third city in the State and situated 309 kilometers from Hermosillo.

Guaymas, population 28,070, also a mineral district, possessing excellent coal beds; the chief town of which, Guaymas, 8,648 inhabitants, is one of the most important commercial ports on the Pacific, 154 kilometers from Hermosillo. It is connected by rail with Nogales.

Hermosillo, population 32,562, very rich in mines; chief town, Hermosillo, is also the capital of the State, with 10,613 inhabitants, and situated 2,527 kilometers from the City of México, 281 from Nogales, and 144 from Guaymas. This city has many fine public buildings, among others the Federal assay office, which in 1902 assayed gold and silver for coining purposes to the value of $70,000 and for export to the value of $370,000, the Cathedral, a library, and the Government Palace. It is one of the railroad stations of the Sonora Line.

Ures, population 25,594; chief town of the same name 76 kilometers from Hermosillo.

TABASCO.

The State of Tabasco, population 159,834, whose capital city is San Juan Bautista, rising from 14 to 27 meters altitude, population 10,543, lies in the southeastern part of the Republic.

Boundaries.—Its boundaries are the Gulf of Mexico on the north, the State of Campeche on the east, Chiapas on the south, Veracruz on the west, and the Republic of Guatemala on the southeast. Its area is 26,094 square kilometers.

Situation.—On the Gulf the coast line of the State extends for 190 kilometers, and is low and healthful, the natural depression of the soil forming several lakes. There are no capes, bays, or sheltered harbors along the coast, but vessels find anchorage in the mouths of the rivers, called bars, the principal of which are the San Pedro and San Pablo, formed by the river bearing that name at the boundary between Tabasco and Campeche; the Tabasco, Frontera, or Principal, formed by the Grijalva, giving access to the port of Frontera and the capital of the State; the Chiltepec, which is the widest and deepest of all, formed by the Gonzalez River, and the Tonalá, formed by the river Tancochopa, the boundary between Tabasco and Veracruz.

Topography.—The surface of the State is generally a plain, slightly broken by hillocks and river beds, except toward the south and southeast, where a spur of the Sierra Madre rises. The highest mountains

are the Ixtapangajoya, the Coconá, Puyacatengo, Madrigal, Quemado, Tortuguero, Limón, and Chinal.

Hydrography.—Of all the States of México, Tabasco possesses the best hydrographic system. Two large basins, the Usumacinta and the Grijalva, collect the innumerable streams. The Usumacinta River is formed by the junction of the Pasión and Salina rivers (both entering from Guatemalan territory), and is afterwards joined by the waters of the Chajill, Jataté, Lacantán, Cendales, and others. This river is 800 kilometers in length, and navigable 300 kilometers from its mouth for good-sized steamers. The Grijalva River is formed by the confluence of the Mexcalapa and the Sierra, or Tacotalpa. The former rises in the State of Chiapas, and receives throughout its extent more than 30 streams, and is navigable for 125 kilometers. The Tacotalpa also takes its source in Chiapas, and has numerious tributaries. The Grijalva proper commences with the junction of these two streams, and empties into the Gulf of Mexico, and is navigable from the Frontera bar as far as Las Palmas, a distance of 280 kilometers. Other rivers are the Cuxcuchopa, navigable for 60 kilometers, the Soledad, Coccohital, Tular, Tortuguero, and Tonalá. As has been stated, the general character of the land being a plain, with little slope seaward, the rain waters form many lakes. The principal are Matillas, Chichicastre, Zapote, Viento, Ramón, Bernete, Palo Alto, Ballo, Largarten, Encantada, Veladero, Chimal, and Puerto Cabello.

Climate.—The climate is hot, tempered, however, by the numerous streams. Rainfall is abundant, and the temperature during the summer months (February to May) is from 27° to 28° C. (80° to 82° F.), and in the coolest months (December and January) the mean temperature is from 17° to 18° C. (62° to 64° F.). The prevalent diseases are malarial fevers and dysentery.

Fauna and flora.—The fauna and flora of the State are both rich and varied, including all the species found in other parts of the Republic situated in the same zone.

Resources.—Agriculture, and the industries directly derived from it, constitutes the source of future development; the soil, on account of its topography, is peculiarly rich in spontaneous vegetation. The work[a] from which the data referring to the State of Tabasco are obtained states that the agricultural production amounts in value to 8,000,000 pesos annually, of which 6,000,000 represents the home consumption and the remainder export values. Throughout the State 20,000 men are engaged in farming, 6,000 of whom are plantation owners. The leading products are cacao, sugar cane, coffee, tobacco, corn, rice, fruits, rubber, pepper, vanilla, cedar, mahogany, logwood, and other dye and cabinet woods. According to the "Anuario Esta-

[a] Reseña Económica del Estado de Tabasco. Alberto Correa, 1899.

dístico" for 1897, the number of plantations in Tabasco was 370, divided as follows: Cacao, 124; coffee, 8; sugar cane, 44; cereals, 60; tobacco, 12, and 122 cattle ranches. The production of the State for 1901–2 is officially quoted as follows: Cereals to the value of $1,300,000; sugar cane products, except rum, 2,588,000 kilos, valued at $226,500; rum, 27,646 hectoliters, at $423,354; logwood, 2,329,800 kilos, at $65,000; cacao, $1,551,391; coffee, $120,000; tobacco, $50,000; chicle gum, $280,600.

Stock raising, notwithstanding the great facilities offered by nature, is not as flourishing as should be, the number of cattle being estimated by Correa at about 150,000 head.

Mining.—Mining receives practically no attention, no precious minerals being found within the limits of the State; but there are indications of deposits of coal, asphaltum, cinnabar, and petroleum.

Trade.—Commerce is well developed, there being, according to the authority above cited, 500 commercial houses, representing a capital of $4,000,000, established throughout the State. Foreign trade through the port of Frontera during 1901–2 amounted to $416,000 silver for imports and $271,354 for exports. A large share of the trade in dye and cabinet woods seems to be carried on through the port of Carmen, amounting in value to $1,400,000, which would increase the export trade of the State to over $1,600,000 yearly. The leading articles of export are dye and cabinet woods, hides and skins, coffee, tobacco, and rubber. Coastwise and local trade is estimated at a valuation of $1,500,000 for imports and $1,900,000 for exports.

Communications.—Tabasco has no steam railways, but there are three lines of horse cars, one from San Juan Bautista to Carrizal, about 6 kilometers in length; one from Cárdenas to Paso de Cárdenas on the Grijalva River, 7 kilometers, and one (the Interfluvial) between San Juan Bautista and Boca Nueva, 6 kilometers in length. Other lines are projected, among them one to run from Cárdenas to Barra de Dos Bocas, 80 kilometers, and another from Teapa to La Ermita. Wagon roads and mule paths lead to all the principal centers, and there is a daily improving river transit system, 16 steamers being at present employed in this means of communication. Efficient and extended telegraphic, mail, and telephonic service is available.

Industries.—The principal manufacturing industries are the development of sugar-cane products, yielding over $500,000 annually; the manufacture of cigars and cigarettes, and the production of brick, soap, candles, and chocolate.

Divisions.—Politically the State is divided into 17 municipalities, subdivided into rural districts (*Vecindarios rurales*), as follows:

Balancán, population, 3,583; Cárdenas, 9,649; Comacalco, 11,208; Cunduacán, 10,727; Huimanguillo, 14,117; Jalapa, 9,400; Jalpa de Mendéz, 5,870; Jonuta, 3,581; Macuspana, 15,286; Montecristo, 2,591,

Nacajuca, 11,175; Paraíso, 5,478; Tacotalpa, 6,065; Teapa, 7,172; Tenosique, 3,984, their chief towns bearing the same names; also Frontera, population, 8,219, and San Juan Bautista, 31,729, which are the principal municipalities, the former having, as the capital, the port of Frontera and the latter, San Juan Bautista, which is also the State capital, containing 10,543 inhabitants. This city has tramway lines and many fine buildings, among them the palace of the legislative and executive powers, hospitals, a theater, and three churches.

TAMAULIPAS.

The State of Tamaulipas, population 218,948, whose capital city is Ciudad Victoria, 449 meters altitude, population 10,086, is a favored land, requiring only more general irrigation and capital to develop its immense wealth.

Boundaries.—The State is bounded on the north by the Rio Bravo, which separates it from the State of Texas (U. S. A.), on the northwest by Coahuila, on the west by Nuevo Leon, on the south by San Luis Potosí, on the southeast by Veracruz, and on the east by the Gulf of México. The area of the State is 83,597 square kilometers.

Situation.—Tamaulipas occupies one of the most beautiful sections of the Republic. Its coast line stretches from the bar of the Rio Bravo on the north to Tampico on the south, an extent of 400 kilometers, being formed by a succession of sand banks. This part of the State is almost uninhabited, as with the exception of two or three unimportant villages the centers of population are from 8 to 12 kilometers inland. There are several bars, the principal being the Jesús María, at the junction of the Madre Lake and the Gulf of México, which is 800 meters wide and 15 feet below the level of the water at high tide; the Tampico bar, at a depth of from 8 to 9 feet; the Soto de Marina bar and the bar of the Rio Bravo. The prevailing winds on the Gulf coast are from east, northeast, and southeast, but in winter "northers" are frequent and dangerous.

Topography.—The southern and central portions of the State are mountainous, the northern part containing extensive fertile plains, adapted for stock raising. The principal mountain ranges are the Pamoranes, separated from the San Carlos range by 25 to 29 kilometers, and the Sierra Madre, which traverses the southwestern, western, and central portions, its principal peaks being Cerro Mocho and Cerro Shigüe. The most remarkable valley, by reason of its beauty and fertility, is the Jaumave; others are the Rusias and the Santa Bárbara de Ocampo.

Hydrography.—Tamaulipas has four large rivers which may be made navigable; also several small lakes and many small streams. The principal rivers are the Rio Bravo del Norte, the boundary line between México and the United States, flowing from northwest to southeast,

and emptying into the Gulf of México; the Conchas, also called the Presas; the Soto de la Marina, navigable for 50 kilometers from its mouth, and the Guayalejo, with their respective tributaries. The most important lakes are on the Gulf coast, and are the Laguna Madre, 210 kilometers in length, containing several small islands; the Pesquerías, or Morales, 34 kilometers long, also containing small islands; the Tordo, San Andrés, Chairel, Champayán, and Carpintero. Mineral springs abound.

Climate.—The climate of Tamaulipas is generally hot and damp on the coast and in the vicinity of the lakes and rivers; temperate on the slopes of Sierra Madre and in the valleys, and dry and temperate in the Lágrimas Valley. Rainfall is abundant in the sierras and moderate in the valleys, and throughout the district watered by the Rio Bravo frost is frequent. The highest temperature experienced in the State is from 32° to 33° C. (89° to 91° F.), and the lowest 15° to 24° C. (59° to 75° F.), the extremes being at noon and midnight. The prevailing diseases are malarial fevers and affections of the respiratory and digestive organs.

Fauna and flora.—The fauna and flora are rich and varied and present the same general features as mark that of other Mexican States.

Resources.—Agricultural products are, in the main, such as exist elsewhere in the Republic, cereals, leguminous plants, sugar cane, coffee, tobacco, cotton, and maguey. Official figures for 1897 credit the State with 76 plantations, as follows: Cotton, 3; sugar cane, 28; cereals, 23; and 22 cattle ranches, the valuation of their production for 1901-2 being given at about $1,150,000 for cereals; sugar-cane products, except rum, $75,000; rum, $1,000; cotton, $32,000; coffee, $10,000.

Mining.—Although the mineral wealth of the State is most abundant, it has not been developed to any extent. The minerals found are gold, silver, iron, and copper; also salt, marble, and asphalt; the number of mining claims registered to December 31, 1902, amounted to 81, covering 938 hectares, and the total production of the State—5 mines in operation—was, during the same period, 585,000 kilos, valued at $60,000.

Trade.—The commercial future of Tamaulipas is assured by reason of its excellent ports, its close proximity to the United States, its railroad lines, and natural wealth, its present disadvantages being limited to a lack of population and adequate capital and to restricted means of foreign communication. Tamaulipas and Nuevo Leon are the principal mercantile centers, the exports of the former town consisting of beef cattle, horses, ixtle, sarsaparilla, woods, fruits, hides and skins, rubber, and asphalt, while the imports are plows, machinery, arms, hardware, alimentary products, wines and liquors, cotton, silk, and

woolen goods, etc. The frontier of this State bordering on the United States belongs to the Free Zone.

Communications.—Three railroad lines traverse the State, the Mexican National, the Monterey and Gulf, and the Mexican Central. The first-mentioned line crosses it twice, first in the northwest, on the International Line from México to Nuevo Laredo, and again in the north, on the Matamoros, San Miguel and Monterey Line. The Monterey and Gulf Line crosses it diagonally from west to northeast on the Monterey, Tampico and Treviño road, and the Mexican Central on the line from Tampico to San Luis Potosí. The Central also has a line from Chicalote to Tampico. There are four lines of tramways in Matamoros, one in Nuevo Laredo, one in Victoria, one in Tampico, and another connecting this port with the capital. Concessions have also been granted for several more lines. Telephone, telegraph, and mail service is efficient and extended. Several steamship lines touch at Tampico, the principal being the Hamburg-American, the Harrison, the West India and Pacific, and the New York and Cuba Steamship Company. Wagon roads are numerous, but their condition leaves much to be desired.

Industries.—Besides manufactured products directly derived from agriculture, such as sugar, rum, etc., the State also has beer, soap, and candle manufactories.

Divisions.—Tamaulipas is divided into 4 districts, subdivided into 38 municipalities. The districts and their principal cities are as follows:

Distrito del Norte, population 68,727; its chief town is Matamoros, population 8,347, 293 kilometers from Victoria, the State capital. This is a fluvial port, on the Rio Bravo, 50 kilometers from the Gulf coast, and carries on a large trade. It is a fine city, possessing many public buildings, tramway lines, a chamber of commerce, etc. Next in importance comes Nuevo Laredo, population 16,600, on the Rio Bravo, opposite the American town of the same name (Texas), with which it is connected by an iron bridge. It has a frontier customs port, a chamber of commerce, and is the second customs district of the Republic. It is distant 547 kilometers from the City of México by rail and 320 from Matamoros. Other important towns are Guerrero and Mier, also frontier customs ports, and Reynosa and Camejo. Foreign trade through the Laredo custom-house, according to invoice valuation, is officially estimated for 1901–2 at $7,145,171 for imports and $6,397,761 for exports.

Distrito del Centro, population 55,073, whose chief town, Ciudad Victoria, is also the State capital, containing 10,086 inhabitants, and distant 1,367 kilometers from the City of México by rail; 550 from Nuevo Laredo, and 233 from Tampico. The city possesses a chamber of commerce, many fine public buildings, tramways, and other modern improvements, and as it lies on the line of the Monterey and Gulf

Railway, it has a large trade. Other important towns are Soto de la Marina, a fluvial port, 63 kilometers from the Gulf, the river from which it takes its name being navigable for more than 141 kilometers, Villagrán, San Carlos, and Hidalgo.

Distrito del Sur, population 42,248; its chief town, Tampico, population 16,313, a Gulf port, is steadily growing in importance. The foreign trade of Tampico, according to the "Boletin de Estadística Fiscal" for 1901–2, amounted during that year to $10,279,068 for imports and $46,900,360 for exports, according to invoice valuation. Its custom-house receipts up to the end of November, 1899, were larger by a considerable sum than those of the great port of Veracruz. The Panuco River, which flows by it, waters one of the most valuable sections of the territory of the Republic, where agriculture and stock raising offer inducements not equaled elsewhere in the country. The navigation business on this river is constantly increasing.

The city possesses several fine public buildings, tramways, a chamber of commerce, and all modern conveniences, and is the terminus of two railroad lines, the Monterey and Gulf and the Mexican Central. Other important towns are Altamira, Aldama, Nuevo Morelos, and Quintero.

Cuarto Distrito, population 52,900; its chief town is Tula, population 6,935, 160 kilometers from Victoria, and one of the principal commercial centers of the State. Other towns are Ocampo, Jaumave, Palmillas, and Bustamante.

TLAXCALA.

The State of Tlaxcala, population 172,315, with a capital city bearing the same name, 2,252 meters above the sea, is the smallest State in the Republic.

Boundaries.—Its boundaries are the State of Puebla on the north, east, and south, and México on the west, its area measuring 4,132 square kilometers.

Topography.—Tlaxcala is situated within the cold region of México, and its valleys, though sandy, are fertile. It forms a portion of the Central Plateau, being situated over 2,000 meters above the level of the Gulf. The eastern slopes of the Popocatepetl range rise in the west of the State, while toward the south rises the Malinche range with its snow-capped peaks, Malintzi, 4,107 meters in height, and the Xaltonale, 3,848 meters high. The highest points in the eastern portion of the State are Peñón del Rosario, 3,359 meters, and Huitintepec, 3,080 meters high. Other elevated points throughout the State range from 2,000 to 2,700 meters in height. The principal valleys are the Huamantla, the Pié Grande, Apam, and Zahuapam.

Hydrography.—The principal rivers are the Zahuapam, emptying into the Atoyac, and the Atoyac and its few tributatries. There a—

also several permanent streams, among them the Negros, Tenexac, Achiachiapam, Totólac, and Tequixquiatl. The principal lakes are the Acuitlapilco, 105 hectares in extent, Rosario, 252 hectares, Xonecuila, and Santa Clara.

Climate.—The climate of the State is cold and healthful, as its mean altitude is between 2,000 and 3,000 meters above sea level. Rainfall is moderate throughout the year and frost is frequent during the winter. The prevailing diseases are typhus and malarial fevers and affections of the respiratory organs.

Fauna and flora.—The fauna and flora embrace the usual species indigenous to the Mexican States.

Resources.—Tlaxcala is essentially an agricultural State, cereals and pulque forming the chief products. Official figures for 1897 credit it with 154 plantations, devoted in the following proportions to various cultures: Cereals, 100, and maguey, 48; and 6 cattle ranches. The valuations for 1901–2 are officially quoted as follows: Cereals, $2,442,227; pulque, $2,136,746.

Mining.—The State has no importance as a mining district, though gold, silver, lead, cinnabar, and a small proportion of coal have been found.

Trade.—The value of the annual commerce is estimated at about $8,000,000, consisting chiefly in the export of pulque to the City of México and to Puebla and adjacent States; of cereals and other agricultural products, paper and cotton from the native mills, flour, etc., the principal imports being alimentary products, hardware, furniture, machinery, and agricultural implements.

Communications.—Three railroads cross the State; the Mexican, running on the México and Veracruz line and on the Apizaco and Puebla branch; the Interoceanic, from Acapulco and Veracruz to México, and the Santa Ana and Tlaxcala road, from Chiantempan to Tlaxcala. There are several wagon roads in good condition leading to the adjacent States. Postal, telegraph, and telephone service is good and extended.

Industries.—The principal manufacturing establishments of the State are its cotton and print mills, a glass factory, and several foundries.

Divisions.—The political divisions of the State are 6 districts, subdivided into municipalities. The districts are:

Ocampo, population 20,279; its chief town is Calpulálpam San Antonio, on the Interoceanic Railroad, 60 kilometers from the State capital.

Morelos, population 18,662; its chief town is Tlaxco San Augustín, 42 kilometers from Tlaxcala.

Juárez, population 36,056; its chief town, Huamantla, is 38 kilometers from Tlaxcala.

Zaragoza, population 38,650; its chief town, Zacateco Santa Inés, 12 kilometers from Tlaxcala.

Hidalgo, population 39,213, whose chief town, Tlaxcala, the State capital, with 3,000 inhabitants, is also the most important town in the State, possessing many fine buildings, and having rail connection with the City of México.

Cuauhtemoc, population 19,455; its chief town is Barrón-Escandón, or Apizaco, situated on the line of the Mexican Railroad, 26 kilometers east of Tlaxcala.

VERACRUZ.

The State of Veracruz-Llave, population 981,030, whose capital city is Xalapa, or Jalapa, 1,429 meters altitude, population 20,388, is considered one of the richest and most beautiful regions of the globe. Its area is 75,863 square kilometers.

Boundaries.—The boundaries are Tamaulipas on the north, San Luis Potosí, Hidalgo, and Puebla on the west, Oaxaca on the south, and the Gulf of México on the east.

Topography.—Veracruz occupies a narrow strip of land rising gradually from the coast line to the crest of the Sierra Madre Mountains. Almost the entire section is mountainous, the Sierra Madre range occupying the western central portion, running from north to south, and rising to the height of 4,089 meters above sea level in the peak of Nanchampapetl, or Cofre de Perote. To the south is the majestic snow-capped volcano Citatepetl, or Orizaba, 5,295 meters above the level of the sea. Other ranges are the Maltrata, Alcucingo, Jalacingo, Oxocupan, and Zongolica. The eastern litoral, bordering on the Gulf of México, is 460 kilometers in extent, stretching from the Tampico Bar to Tonalá. The northern section of this coast line is called the Windward coast, while to the south, from Veracruz to the bar of Tonalá, is the Leeward coast. The shore line is broken by numerous bars, shoals, islands, capes, etc.

Hydrography.—Hydrographically the State may be divided into two basins, the northern extending from the Panuco River to the Rio Blanco, and the southern from the latter stream southward to Taucochapa. The rivers susceptible of navigable development are the Panuco, Túxpam, Vinasco, Yautepec, Tecolutla, Nautla, Blanco, and Papaloápam, all having several tributaries and forming the hydrographic basins above mentioned. There are also several lakes, among them the Catemaco, Ostión, Mexcalapa, Tortuguero, and Tecunanapa.

Climate.—The climate is very variable, being hot and unhealthy in the south and on the coast, yellow fever, dysentery, and black vomit prevailing; temperate and, at times, humid at altitudes of more than 1,000 meters; temperate and healthful on the mountain slopes; cold at an altitude of 1,500 meters, and hot in the north.

Fauna and flora.—The fauna and flora of the State are both rich and varied, embracing the species usual in other portions of the Republic.

Resources.—The agricultural products include all such as are indigenous elsewhere to México. Official figures give the State of Veracruz 751 plantations in 1897, divided as follows: Cotton, 23; coffee, 98; sugar cane, 106; cereals, 189; fruits, 3; tobacco, 45; woods, 8; and 279 cattle ranches.

There is no available data for the production of Veracruz for 1901–2. The "Anuario Estadístico" for 1900–1901 credits the State with the following figures: Cereals, $7,094,673; sugar-cane products, rum excepted, 41,137,598 kilograms, at $3,858,284; rum, 149,209 hectoliters, at $2,371,160; maguey products, $81,400; textile fibers (cotton and ixtle), $223,330; dyewoods, $124,000; tanning barks, $15,000; coffee, 17,765,347 kilos, at $5,880,656; tobacco, 5,394,946 kilos, at $1,740,234; vanilla, 124,000 kilos, at $1,350,000. Stock raising is also one of the sources of wealth and may be estimated at a value of from 24,000,000 to 25,000,000 pesos.

Mining.—Many rich mines are included within the borders of the State, the principal yielding gold, silver, lead, iron, mercury, copper, coal, petroleum, asphalt, and marble, and also such precious stones as opals, agate, lapis lazuli, and amethysts. The number of mining claims registered during the calendar year 1901 was 46, covering 678 hectares, while the total output of the 3 mines in operation for the same period was $45,000.

Trade.—Veracruz is one of the most important commercial sections of the Republic, its trade having outlets not only throughout México but also to the United States, Europe, the West Indies, and South America. The chief ports are Veracruz, Túxpam, and Coatzacoalcos, devoted to foreign commerce, while the other gulf ports are open to coastwise trade only. Exports from Veracruz cover almost all the articles that México sends abroad, while the imports are of an equally general character. The total trade of the port, both foreign and domestic, amounts to about $100,000,000 per annum.

The foreign trade of these three ports is officially given as follows, and the "Boletin de Estadística Fiscal," for 1901–2:

	Imports.	Exports.
Veracruz	$20,966,363	$26,497,693
Túxpam	57,381	241,858
Coatzacoalcos	475,923	496,741

Communications.—The railways include the Mexican line from Veracruz to México, the Interocanic, the Veracruz and Alvarado, the Central in the north, the Córdoba and Tuxtepec, and two short lines, one from Veracruz to Antigua and one from Jalapa to Coatepec. Many

PORT OF VERACRUZ, STATE OF VERACRUZ.

fine highways also connect with the principal towns of the adjacent States. Maritime communication is effected by means of the several steamship lines touching at Veracruz and other ports, viz: The French Transatlantic, the Hamburg-American, the Royal Mail, the Harrison, the West India and Pacific, the Morgan, and the Ward lines. Coastwise steamers also ply between home ports. A cable lines runs from Coatzacoalcos to Galveston, with stations at Veracruz and Tampico. Telegraph, telephone, and postal communication is efficient and extensive.

Industries.—In addition to the industries directly connected with agriculture, mining, and stock raising, the State has many manufacturing interests, such as cotton, woolen, saw, and paper mills, and establishments for the manufacture of chocolate, wax matches, soap, candles, and cigars, and several foundries.

Divisions.—The State is divided into eighteen cantons, subdivided into municipalities. The cantons may be classed in two groups of nine each, called, according to their geographical position, maritime and interior respectively; they are subdivided as follows:

Northern maritime, embracing Ozuluama, population 38,990; Túxpam, 58,282; and Papantla, 50,756, their chief towns bearing the same names, respectively, Túxpam being a seaport open to foreign trade.

Central maritime, embracing Misantla, population 21,250, whose chief town bears the same name; Jalapa, 82,669, the chief town of which is Jalapa, also the capital of the State, with 20,388 inhabitants, situated 310 kilometers from the City of México and 118 from Veracruz, being the principal town of the State, the center of a fine agricultural district, and possessing fine public buildings; and Veracruz, 110,172, whose chief town bears the same name and is the first commercial port of the Republic, 424 kilometers from the City of México. The chief public buildings of the city of Veracruz are the municipal palace, the People's Library (containing over 20,000 volumes), a theater, several churches, and the Artillery School. This city is in constant commnnication with the principal ports of the United States, Europe, and the West Indies by means of a submarine cable and steamship lines. It is the seat of the Chamber of Commerce, has three banks, a consular corps, and is equipped with two light-houses, street railways, and other modern conveniences. Other towns in the canton are Alvarado and Tlacotálpam, the latter a fluvial port on the Papaloapam River.

Southern maritime, embracing Los Tuxtlas, population 43,824, the chief towns being San Andrés de Tuxtla and Santiago de Tuxtla; Acayucam, population 38,164, its chief town bearing the same name; and Minatitlán, population 34,490, with its chief town bearing the same name, a railway station. Coatzacoalcos, a gulf port and the third town in the State, is also in the canton of Minantitlán.

Northern interior, embracing the cantons of Tantoyuca, population 56,179, and Chicontepec, 66,517, their chief towns bearing the names of the cantons.

Central interior, embracing Jalacingo, population 67,016; Coatepec, 50,451; Huatusco, 35,534; Córdoba, 79,130; Orizaba, 85,945; and Zongolica, 29,740; their chief towns bearing the same names as their respective cantons. Orizaba, population 32,894, deserves especial mention as the second city in the State.

Southern interior, comprising the canton of Cosamaloápam, 32,371, with its chief town bearing the same name.

YUCATÁN.

The State of Yucatán, population 314,087, whose capital city is Mérida, about 8 meters altitude, population 43,630, is the greatest henequén-producing region of the world.

Boundaries.—It is bounded on the north by the Gulf of México, on the east by the Caribbean Sea, on the south by British Honduras and Guatemala, and on the west by the State of Campeche. It comprises an area of 91,201 square kilometers.

Situation.—The peninsula of Yucatán is an immense plain, which, starting from the coast line, rises gradually toward the interior to a height of from 40 to 60 meters. In the northwest, where Mérida is located, the soil is of a calcareous, dry, and rocky formation, and until the culture of henequén transformed it into one of the richest regions of México it was proverbially sterile. The fertility of the land increases toward the northeast, while the southeast section offers great natural opportunities for wealth, abounding as it does in virgin forests filled with valuable dye and cabinet woods and in stretches of land suitable for the culture of all the vegetable species. This territory is, however, occupied by rebel Indian tribes and has not been accessible to progress and civilization for more than fifty years.[a]

Topography.—There are two small mountain ranges in the State; the one, called Puc in the Maya tongue, is so uniform in its extent and at so slight an elevation above sea level that it might more properly be termed an elongated hill. This range, which starts near the partido of Macanú, extends toward the east, thence in a southerly direction, after which it turns SSE. for a distance of 120 kilometers, gradually decreasing in altitude until, near Peto, it merges into a savanna or plain. The other range is formed by a series of hills starting near the coast. Several islands lie along the coast, viz, Pájaros and Perez to the north; southwest of these is Arenas, while near Cape Catoche are Halboy, Contoy, and Blanca, and off the western coast are Mujeres,

[a] The territory of Quintana Roo, created by act of December 14, 1900, occupies the main portion of these lands. Several important concessions have been granted for the colonization and development of the new territory.

Cancum, and Cozumel. Small cays, which are dangerous for navigators, abound in the vicinity of Cape Catoche. Mujeres Island, however, possesses a fine harbor, which with the port of Progreso (open to foreign traffic) and the ports of Cozumel, Halboy, Celestún, Telchal, Chicxalub, Chuburná, Santa Clara, Kxilam, Bravo, and Sisal are the principal coast towns. Sisal is at present almost deserted, though it was formerly the chief port of the State. The coasts of Yucatán, 990 kilometers in length, are very low, and, judging from the shells found among the rocks and in deep diggings, the entire peninsula was at one time covered by the sea.

Hydrography.—There are no rivers, and all drinking water is obtained from natural wells sunk to a greater or less depth. The so-called Lagartos River is in reality a shallow arm of the sea, and is remarkable for the fact that at a distance of about 400 meters inland pools of fresh water spring up amid the salt. These are called "Bocas de Conil," and are supposed by Humboldt to be due to immense hydrostatic pressure from the interior of the earth. Such springs are also found on the Windward coast. Throughout the State are many springs called locally *sartenejas*, *aguadas*, and *cenotes*, the first being deposits of rain water among the rocks; the second large reservoir-like pools, some of them having been constructed by the ancient inhabitants, and the third beautiful caverns where water is found in immense quantities. The only lake is the Chichankanab, SE. of Mérida, about 32 kilometers distant from Peto, the peculiar characteristic of which is that the waters, though beautifully clear, are very bitter, and that the bed is composed of crystals closely resembling Epsom salts.

Climate.—The climate is generally pleasant, the maximum temperature in summer being 32° C. (89° F.) and the minimum in winter 19° C. (66° F.), the summer heat being tempered by cool breezes. Malaria and other fevers are the prevailing diseases.

Fauna and flora.—The fauna of the State embraces almost all the species found throughout the Republic, while the flora is no less rich and varied.

Resources.—The principal sources of agricultural wealth consists in the cultivation of henequén, but in the northwest section there are a few sugar-cane plantations, while in the northeast or forest region dye and cabinet woods, chicle gum, tobacco, and vanilla are grown. Mexican official figures for 1897 give Yucatán 826 plantations, divided as follows: Sugar cane, 94; cereals, 159; henequén, 348; and 225 cattle ranches. The principal products for 1901–2 are estimated as follows: Corn, to the value of $1,209,747; sugar cane products, direct, 3,050,000 kilos, at $245,000; rum, $270,000; henequén, 51,868,900 kilos, valued at $16,192,029; dye woods, 3,000,000 kilos, $100,000; chicle gum, $48,000; sugar cane, $345,000. In 1898 the extent of cultivated lands throughout the State was given officially as 54,564

hectares, of which 21,835 were devoted to corn. Stock raising, though carried on to a considerable extent, does not meet the requirements of home consumption, large quantities of cattle being imported from the adjacent States, especially from Tampico. The "Boletín de Estadística," an official publication issued by the State, estimates the yearly importation of beef cattle at 7,000 head.

Mines.—There are no mines in the State; it, however, possesses several kinds of building stones, clay, gypsum, etc.

Trade.—The foreign trade of Yucatán is carried on almost exclusively through the port of Progreso. During 1901–2 the imports were valued at $5,017,566 and the exports at $31,931,877. The exports of henequén during the calendar year 1903, from Yucatán through the ports of Progreso and Campeche, consisted of 611,939 bales, valued at $36,040,032.32.[a] The distribution of the bales was as follows:

United States	596,676
Cuba	8,066
England	4,286
Canada	1,200
France, Spain, Germany, Belgium	1,711
Total	611,939

The exports of henequen during the last five years were:

1899	445,978
1900	499,626
1901	517,519
1902	528,246
1903	611,939

There has been a steady increase in the production of henequen, and the yield for the year 1904 is estimated to exceed that of 1903.

Communications.—The railways of the State are: The Mérida and Progreso, 36 kilometers; the Izamel, 66 kilometers; the Mérida and Valladolid, with a branch to Progreso, 78 kilometers; the Mérida and Peto, 127 kilometers, running to San Antonio, and the Peninsular road from Mérida to Campeche, 173 kilometers. In May, 1899, a company was organized under the name of the Yucatán Southeastern Company, with a capital of $1,000,000, Mexican silver, to open up vast uncultivated regions in the old Maya peninsula. There are also 36 kilometers of street railways in Mérida, and several wagon roads. Maritime communication is carried on by means of the New York and Cuba Mail Steamship Company, the Imperial German Mail, the Harrison Line, the West India and Pacific Steamship Company, the Spanish Transatlantic Line, two Mexican lines, the Prince Line, the Johnston Line, and others. Telegraphic, telephonic, and mail services are efficient and extended.

[a] "Mexican Herald," January 21, 1904.

Industries.—The principal industry of the State is the manufacture of henequén ropes and bags. An American firm has established a factory for the preparation of vegetable pepsin from the *papaya* (*carica papaya*).

Divisions.—Politically, Yucatán is divided into 17 partidos, subdivided into municipalities. The partidos are:

Acanceh, population, 22,677; its chief town, oearing the same name, is situated 25 kilometers by rail from Mérida, the State capital.

Espita, population 10,489, with a chief town bearing the same name.

Hunucmá, population 18,656, with a chief town bearing the same name, is 36 kilometers by rail from Mérida, the port of Sisal being also one of its towns.

Las Islas, population 3,141, chief town, Isla de Mujeres, a seaport. The two other ports of the partido are Cozumel and Halboy.

Izamal, population 21,358; chief town, bearing the same name, is 66 kilometers from Mérida.

Maxcanú, population 19,673; its chief town of the same name is 58 kilometers from Mérida, the port of the partido being Celestún.

Mérida, population 60,156, whose chief town, Mérida, is also the capital of the State, containing 43,630 inhabitants, according to the official census of 1900. This is one of the richest cities of the Republic, possessing handsome buildings, street-railway lines, a board of trade, three banks, and all modern conveniences. It is also the railway center of the State.

Motul, population 18,756, with a chief town of the same name, 46 kilometers from Mérida, the port of the partido being Telchac.

Peto, population 10,636, with a chief town of the same name, is a railway terminus.

Progreso, population 8,832, whose chief town, Progreso, population 5,125, is 36 kilometers from Mérida. It is the principal port of the State and the second in the Republic for its import trade, the vessels calling there numbering yearly from 500 to 550, of which 350 are steamers. The port is not safe, especially in bad weather. Other ports in the partido are Chicxulub and Chuburná.

The other partidos are Sotuta, population 9,855, Tekax, 19,757; Temax, 17,058; Ticul, 25,057; Tixkokob, 14,072; Tizimín, 9,174; and Valladolid, 24,740, the chief towns of which bear the same names as their respective partidos.

ZACATECAS.

The State of Zacatecas, population 462,190, the capital city of which is Zacatecas, 2,496 meters altitude, with 32,856 inhabitants, is one of the important interior States of the Republic.

Boundaries.—Its boundaries are: Coahuila on the north, San Luis Potosí on the east, Jalisco and Aguascalientes on the south, and Durango on the west, its total area being 63,386 square kilometers.

Situation.—Situated on the high Central Plateau of the Republic, this State is one of the most mountainous regions of the country, and is formed by the extension of the Sierra Madre range. Its mean altitude is 2,230 meters, the highest point being 3,090 meters and the lowest 1,573.

Topography.—Owing to topographical conditions, agriculture does not prosper throughout its extent. The principal mountains are Mazapil, Tecolotes, Novillos, Calabozal, Pichihualtepec, Pitiquitas, San Pedro, Tetillas, Mesquital, Melilla, Chacuaco, Chapultepec, and the peak of Teyra.

Hydrography.—The two principal rivers are the Juchipila and the Nieves, respectively 230 and 225 kilometers in length. Other rivers are the tributaries of those above mentioned and the Jerez, the Tlaltenango and Teul. There are no large lakes, but pools of clear, cold water and mineral springs abound.

Climate.—The State possesses three climatic regions, the first between 1,550 and 2,000 meters above sea level, the second from 2,000 to 2,400 meters, and the third from 2,400 to 3,000 meters, the thermometer ranging from 11° to 21° C. (about 52° to 70° F.), according to the altitude. Rainfall is abundant throughout the State, and the winds from the west are cold, while those from the southeast are warm. Fevers and pneumonia are the most common ailments.

Fauna and flora.—Although the fauna of the State is not known very thoroughly, it may be said to embrace such species as are common to other parts of the Republic, the same being applicable to the flora.

Resources.—As has been stated, Zacatecas can not be classed among the important agricultural sections of México. Cereals are, however, its best crop, sugar cane and maguey following.

Mexican official statistics for 1897 give the following data in regard to the State: Number of plantations 189, divided as follows: Coffee, 4; cereals, 80; maguey, 15; and 90 cattle ranches. The principal agricultural products for 1901–2 are officially given as follows: Cereals, $3,142,146; sugar-cane products, rum excepted, 3,049,300 kilos, at $245,000; rum, $6,600; mescal, $122,000; other maguey products, $20,000; ixtle, $6,300; grape wine, $3,200; tanning barks, $10,000; tobacco, $8,000.

Stock raising forms one of the chief sources of wealth, the Zacatecas stock being renowned throughout the Republic, the sheep especially being considered unequaled, both on account of flesh and wool. Foreign stock has been imported to improve the native breeds, and the experiment has been eminently successful.

Mining.—From a mineral standpoint this State is one of the richest regions in the world, as it contains the Sierra de Zacatecas, which has produced fabulous quantities of silver. Other minerals found in

greater or less quantities are gold, mercury, iron, copper, zinc, lead, coal, bismuth, and salt. During the year ending on December 31, 1902, official statistics give the number of mining claims registered as 1,485, covering 15,293 hectares. The number of mines in operation during the same period were 102, the total output being officially estimated at 176,545,485 kilos, valued at $5,224,779.

Trade.—Commercially Zacatecas is one of the most important centers of the Republic, its trade being estimated at about $41,000,000 per annum, as follows: Imports, $15,000,000; exports, $19,000,000; local trade, $7,000,000. The United States, Europe, and the City of México receive the mineral exports, the former taking ores and the two latter silver bullion and coin. Other products, consisting chiefly of cereals, live stock, tallow, horns, bones, mescal, etc., go to the adjacent States. Imports from México City, the United States, and Europe comprise groceries, ready-made clothing, hardware, machinery, agricultural implements, arms, and ammunition.

Communications.—The Mexican Central and the Mexican National railroads traverse the State, the former from southeast to northwest on the International line from México to Ciudad Juarez and on the Aguascalientes and Tampico line, and the latter on the Zacatecas and San Luis Potosí road. There is also a narrow-gauge road connecting Guadalupe and Zacatecas, as well as several wagon roads. Telegraphic, telephonic, and postal services are efficient and extended.

Industries.—The principal manufacturing industries are the production of sugar, rum, and wine, the reduction of ores, and the manufacture of cotton, woolen, and knit goods, carriages, candles, soap, and chocolate.

Divisions.—The State is divided into 12 partidos, subdivided into municipalities. The partidos and their principal cities are:

Mazapil, population 23,052, an important mining section, the chief town of which bears the same name and is situated 336 kilometers from Zacatecas.

Fresnillo, population 53,132, the second agricultural and stock-breeding partido of the State; its chief town, Fresnillo, population 6,309, lies on the Central Railroad, 59 kilometers from Zacatecas.

Zacatecas, population 74,591, one of the richest silver-bearing districts in the world, its chief town bearing the same name, being also the State capital, with 32,856 inhabitants. It is also one of the principal cities of the Republic, and is situated on the line of the Central Railway, 706 kilometers from the City of México, 1,130 from the port of Veracruz, 121 from Aguascalientes, and 787 from the port of Tampico. The city is equipped with all modern conveniences and possesses many fine public buildings, among others the municipal palace; the mint, which according to official statistics coined in 1901–2

silver to the amount of $7,281,000; the Institute of Sciences, the cathedral, and many churches, hospitals, schools, etc. According to old statistics the partido of Zacatecas yielded in the period from 1548 to 1832 minerals to the value of 667,343,299 pesos. Guadalupe, population 8,781, is the second town in the partido, being of considerable commercial importance.

Ojocaliente, population 13,830, the chief town of which, bearing the same name, is 34 kilometers from Zacatecas.

Pinos, population 45,859; its chief town, situated 125 kilometers from Zacatecas, bears the same name, and is rich in minerals and produces large quantities of maguey mescal.

Villanueva, population 40,616, is an agricultural region, the chief town of which, bearing the same name, is 50 kilometers from Zacatecas.

Juchipila, population 21,378, also an agricultural section, with a chief town of the same name, is 251 kilometers from Zacatecas.

Nochixtlan, population 20,562, with a chief town of the same name, is 246 kilometers from Zacatecas.

Tlaltenango, or Sánchez Román, population 39,013, is a mining region; its chief town, bearing the same name, is 202 kilometers from Zacatecas.

Jerez, population 51,000, is the first agricultural section in the State, its principal town, of the same name (called also Ciudad García), is situated 50 kilometers from Zacatecas.

Sombrerete, population 47,707, is a fine mining region, the chief town of the same name being situated 88 kilometers from Zacatecas, the town of Chalchihuites ranking next in importance.

Nieves, population 31,448, the principal towns of which are Nieves, 185 kilometers from Zacatecas, and Rio Grande, or Gonzalez Ortega, at a distance of 164 kilometers.

TERRITORIES.

BAJA CALIFORNIA.

The Territory of Baja (Lower) California, population 47,624, is a peninsula extending from north to south into the Pacific Ocean for a distance of over 1,500 kilometers.

Boundaries.—Its boundaries are the State of California (United States) on the north, the Gulf of California on the east, and the Pacific Ocean on the west and south. The total area is 151,109 square kilometers.

Situation.—The coast line measures 3,000 kilometers, bordered by a number of islands. The principal bays where the ports open to foreign commerce are found are La Paz and Santa Rosalía on the Gulf of California, and Ensenada Bay on the Pacific. Others worthy of note are San Quintín, San Sebastián, Vizcaino, San Pablo, San Roque, Asunción,

Magdalena, Ballenas, Pequeña, and Almejas on the western or Pacific side, while on the gulf or eastern coast are San Felipe, San Luis, Remedios, Angeles, Animas, San Carlos, Concepción, San Nicolás, San Basilio, Ventana, Muertos, Palmas, and San José. The large islands also have their ports and bays, as follows: Angel de la Guarda Island contains the port of Refugio and Humbug Bay; Carmen Island, ports Lobos and Balandra and the bays of Salinas and Gavilanes, and San José Island the Bay of Amortajada, and Cedros Island the Bay del Sur. Other islands on the Pacific coast belonging to the Republic are Guadalupe, which is extremely fertile and rich in cattle; Todos Santos, San Martín, San Gerónimo, Sacramento (a reef), Elide, Cedros, Natividad, San Benito, Asunción, and the large islands of Magdalena, Santa Margarita, and Crecientes. On the gulf side are Montague and Gore at the mouth of the Colorado River, Gonzaga (a reef), the San Luis Islands, the large island of Angel de la Guarda, the Mejía Islands, San Marcos, Carmen, Santa Catalina, San José, Espiritu Santo, Cerralbo, and several others.

Topography.—The peninsula is traversed from end to end by a cordillera running nearer the eastern than the western coast, the descent on the gulf side being extremely abrupt, while on the Pacific side the coast is reached by a succession of low hills. This mountain chain possesses remarkable topographical and geological features, in some places granite, occasionally metalliferous, forming the central portions. Another differential characteristic between the mountains of Upper and Lower California are the rocks of volcanic origin which occupy a large extent of the territory, giving the country a marked aspect of aridity and desolation, this being especially noticeable in the northern part of the territory, which is occupied by the Cupapás chain and the Volcano de las Vírgenes. The highest granite peak is the Cerro del Gigante, near Loreto, on the gulf coast, the altitude of which is estimated at 1,300 meters above sea level.

Hydrography.—With the exception of the Colorado River in the north and several small streams in the center and south, among which are the Mulejé, Todos Santos, San José, Miraflores, and Purísima, the peninsula is lacking in means of irrigation.

Resources.—Lack of irrigation and scarcity of rainfall are the causes of the general sterility of the soil and the consequent limitations of agricultural development. Notwithstanding this, however, there are in some portions of the peninsula spontaneous productions of the soil which yield large profits. Principal among these is the archil, or Spanish moss, used for dyeing purposes, which grows profusely throughout an extensive belt between 23° 22′ and 26° 24′ north latitude on the west coast. It is not found on the eastern or gulf side, but its growth begins again, though to a limited extent, on the coasts

of Sonora and Sinaloa. Henequén is found in the central regions of the peninsula and hemp in the north near the Colorado River.

Flora and fauna.—Flowers and ornamental shrubs of all the tropical species grow wild, while cabinet and dye woods are also found. Like the flora, the fauna of the territory is limited, the species known being similar to those of the northern Mexican States. On the western coast the sperm or oil whale and otter are found. The Gulf of California abounds in shells and pearls from Mulegé to Cape Porfía, while seals are found in the waters of Tiburón, Angel de la Guarda, and San Lorenzo islands.

Climate.—The climate is hot and dry in the north and temperate toward the south.

Agriculture.—Sugar cane and tropical fruits are successfully cultivated in the humid sections, and the grape also receives some attention. The "Anuario Estadístico" for 1897 estimated the number of plantations in the Territory as 30, divided as follows, according to the principal product: Sugar cane, 10; cereals, 13; maguey (mescal) 1; and cattle ranges, 6. For 1901–2 the agricultural production of the Territory is, according to official statistics, as follows: Cereals, $75,624; sugar-cane products, except rum, 1,641,000 kilos, at $180,000; mescal, $8,350; hemp, $3,000; grape wine, $11,645; tanning barks, $18,000; mesquite wood, $251,340; sugar cane, $30,000.

Mining.—The principal mineral products of the peninsula are gold, silver, copper, lead, gypsum, and coal. Physically the Territory might be divided into three sections—the northern, or gold-bearing; the southern, or argentiferous, and the central, or copper region. Silver and other minerals are found here. The former name of the Territory was Real de San Antonio. West of this, in the same cordillera, is Mineral del Triunfo, the site of very important reduction works. In the municipalities of La Paz, San Antonio, Santiago, Mulegé, Comandú, and Ensenada gold is found; silver in San Antonio, La Paz, Todos Santos, Santiago, San José del Cabo, Mulegé, and Comandú, and copper is most abundant in La Paz, San Antonio, Todos Santos, Mulegé, Comandú, and Santa Rosalía, the latter being the most important mining region. It is south of La Paz, and its many mines were first worked by the Jesuits in 1700. The mines of this section in exploitation yield about 200,000 tons of metal annually. Lead is found in San Antonio and Mulegé and coal in Santiago. There are abundant salt deposits, the principal being the "Ojo de Liebre," on the western coast, and those of the islands of El Carmen and San José on the east. The number of mining claims registered to December 31, 1901, amounted to 507, covering 4,765 hectares, and the total output of the 8 mines then in operation was 260,990,610 kilos, with a valuation of $1,590,642.

Trade.—The foreign trade of the Territory is done through the custom-houses of La Paz, San José del Cabo, Santa Rosalía, and Todos

Santos. In 1901–2 this trade, according to the "Boletín de Estadística Fiscal" for that period, was as follows:

	Imports.	Exports.
La Paz	$70,279	$729,438
San José del Cabo	1,452	
Santa Rosalía	957,960	16,342
Todos Santos	176,426	168,425
	1,206,117	914,205

Communications.—In addition to the several high roads and mule paths, the Territory contains two steam railways, one belonging to the El Progreso Mining Company and the other to the Boleo Mining Company, the former in Triunfo and the latter in Santa Rosalía, and measuring 10 and 3.5 kilometers in length, respectively. Several lines of steamers ply between the ports of the peninsula, six Mexican vessels and one American being engaged in this coast trade. Telegraphic and mail communications are efficient, but telephone service is not very extended.

Industries.—Besides the industries directly derived from agriculture and mining, no manufactures of any importance are established in the Territory.

Divisions.—Lower California is divided into two districts—the northern, population 7,583, and the southern, with a population of 40,041. This latter is subdivided into two partidos and seven municipalities; the Partido Sur consisting of the municipalities of La Paz, San Antonio, Santiago, San José, and Todos Santos, and the Partido Centro of Mulegé and Comondú. The principal city is La Paz, which is the capital of the southern district, containing 5,046 inhabitants. Its principal commerce is done with San Francisco, Mazatlán, Guaymas, San Blas, and Manzanillo. Ensenada de Todos Santos is the chief town of the northern district, with about 2,000 inhabitants. Other towns of importance are Santa Rosalía and those which bear the names of their respective municipalities.

TEPIC.

The Territory of Tepic, population 150,098, whose capital city, bearing the same name, is 953 meters above the sea level and has a population of 15,488, has an area of 28,371 square kilometers.

Boundaries.—The boundaries of the State are the Pacific Ocean on the west, the States of Sinaloa and Durango on the north, and Jalisco on the east and south.

Situation.—The Territory, which is situated between 20° 40′ and 23° 20′ north latitude, was formerly a portion of the State of Jalisco, but made a free territory during the administration of President Lerdo de Tejada, in recognition of the services rendered the Republic

of México by the Indian Chief Lozada. The coast line of the Territory measures 500 kilometers in length.

Climate.—The climate of the lowlands is hot, while that of the higher regions is temperate and agreeable, some of the high mountain table lands and slopes being cold.

Topography.—The Sierra Madre range traverses the Territory from southeast to northeast. The eastern portion of Tepic is exceedingly mountainous. Precipitous cliffs and deep *barrancas* (cañons) occur with great frequency. At the bottom of some of these are rapid mountain streams, many of which empty into Santiago River. The western part of the Territory is level, and is crossed by numerous small rivers and creeks. These streams overflow during the rainy season and flood the plains through which they pass, enriching the soil and rendering it wonderfully fertile and productive. In the southern part of the Territory, in the district of Ahuacatlán, the country is almost entirely of volcanic origin. In this part of Tepic is found the celebrated volcano Ceboruc, 1,525 meters above the level of the sea. In 1870 this volcano was in a state of great activity, and threw out immense quantities of lava and ashes. Not far from Ceboruc is the celebrated Sangangüey Peak, which rises to a height of 2,000 meters above the level of the sea.

Hydrography.—The principal river that runs through the Territory is the Lerma, or Santiago, which originates in the tributaries that flow into Lake Chapala, in the State of Jalisco. This important river empties into the Pacific Ocean just to the north of the port of San Blas. Many smaller streams are found in the Territory, a number of which could easily be used for irrigating the fertile valleys through which they pass. The extension of the maritime coast line is about 300 kilometers, and San Blas is the principal port.

Resources.—Agriculture, mining, and cattle breeding are the main resources of the Territory.

Agriculture.—The agricultural productions of the Territory are numerous and abundant. They are similar in variety and number to the productions of the famous agricultural States of Veracruz, Puebla, and Oaxaca. The valley of Jala is famous for its great productiveness, the fertility of the soil being such that the planting of one bushel of corn is said to yield six hundred fold. Besides cereals, cotton, tobacco, sugar cane, coffee, beans, and rice grow luxuriantly. Agriculture is the chief industry of Tepic, and corn and beans are raised in considerable quantities all over the Territory. Wheat and other cereals grow in the districts of Ahuacatlán and Tepic; rice in Compostela, Tepic, Ahuacatlán, and San Blas; cotton in Acaponeta and Santiago Ixcuintle; and coffee, tobacco, and sugar cane in all the districts of the Territory. According to the "Guia General," Tepic has 48 large plantations, 7 of which are devoted exclusively to the culti-

"EL ZOPILOTE" MINING WORKS, TEPIC TERRITORY.

vation of cotton, 4 to coffee, 22 to sugar cane, and 15 to wheat, barley, and other grains. Samples of coffee grown in the Territory of Tepic sent to New York have been pronounced to be of very fine grade, and similar samples sent to Hamburg were valued at a price exceeding not only the Brazilian coffee, but also that of Córdoba and other coffees from the eastern coast of México. The best coffee lands are to be found in the district of Compostela in a zone parallel to the ocean and at an elevation of 800 meters. Tobacco is exported to Central America, which consumes about 1,000,000 kilograms annually of this product grown on the west coast of México. This industry is susceptible of great development. Rubber trees grow wild, but up to the present time no attempt has been made to establish plantations. The same can be said of Yucatan henequen. The soil is also suitable to the cultivation of the olive tree.

The agricultural production of Tepic for the year 1901–2 is officially given in the "Anuario Estadístico," for 1902, as follows: Rice, $142,460; barley, $15,450; corn, $1,352,936; pease, $406,802; sugar-cane products except rum, 2,452,610 kilos, valued at $446,686; rum, $37,500; maguey products, $25,039; ixtle, $2,096; cotton, $144,080; tanning barks, $5,000; coffee, $159,000; tobacco, $169,872; cedar, $176,028; ocote wood, $152,855; sugar cane, 372,835,200 kilos, at $350,880.

Stock raising is carried on throughout the entire Territory. A number of the large plantations have great herds of cattle, sheep, and goats, but the industry is as yet in its infancy. Tepic contains every natural condition that could be desired for the profitable raising of live stock, and this industry is constantly developing and growing in importance.

Mining.—The territory is rich in mineral wealth. The principal mining regions are as follows:

District.	Mining camps.	Class of ores.
Acaponeta	Motaje	Silver.
	Mojocuantla	Do.
	Teponahuata	Do.
	Minitos	Do.
	La Candelaria	Silver and gold.
	San Francisco	Do.
	Montaña de Oro	Do.
Ahuacatlán	Castellana and San Ramón	Silver.
	Pinolillo	Do.
	San José	Do.
	Refugio	Silver and gold.
	Buenavista	Do.
	La Yesca	Do.
	La Rondadera	Do.
Compostela	Huicicila	Silver.
	Espíritu Santo	Do.
Santiago Ixcuintla	Zopilote	Do.
	San Francisco de Tenamache	Do.
Tepic	Aguapán	Do.
	Acuilapila	Do.

The *patio* and lixiviation processes are used in treating the ores from many of these mines. A number of the mining regions are difficult

of access, and many mines are idle due to the lack of favorable transportation facilities. Much of this natural wealth must necessarily lie dormant and undeveloped until railroad communication is established. Official figures for the mining production of the Territory in 1901–2 show that the output of fourteen mines then in operation amounted to 51,637,706 kilos, valued at $1,797,984, while the number of mining claims recorded to the 31st of December, 1902, was 277, embracing an area of 1,720 hectares.

Trade.—The foreign trade of the Territory is carried on through the port of San Blas, the figures for 1901–2 being officially given at $126,710 for imports and $205,203 for exports.

Communications.—There are no railroads in the Territory. San Blas is the principal port and does a large maritime business with the entire Pacific coast of North and South America. A great number of steamships and sailing vessels touch at this port annually. In addition to a large international trade, the coastwise trade is of great importance, and is constantly increasing, San Blas being a great distributing and commercial center. A fairly good wagon road connects San Blas with Tepic, Ahuacatlán, and Ixtlán, and then proceeds to Guadalajara in the State of Jalisco. The other highways of Tepic are not good, many of them being little more than mere mountain trails. When constructed, the proposed railway from Tepic to San Blas will be a powerful factor in the development of the entire Territory.

Industries.—Considerable manufacturing is carried on in the Territory, and especially in the city of Tepic, where there are in operation large cotton, soap, and other factories, provided with substantial buildings and equipped with modern machinery and appliances. The city also contains a large distillery which produces considerable quantities of alcohol and mescal.

Divisions.—The political divisions of the Territory are as follows:

District.	Population.	District.	Population.
Acaponeta	25,640	Santiago Ixcuintla	21,850
Ahuacatlán	39,529	Tepic	45,445
Compostela	12,208		
San Blas	5,416	Total	150,088

The Federal Government maintains 91 primary schools in the Territory, 36 of which are for boys, 26 for girls, and 29 mixed. In 1902 3,019 boys and 3,442 girls attended these schools, and the sum of $86,623, Mexican silver, was paid out by the Government for teachers' salaries and other necessary expenses incurred for educational purposes. Statistics show that during the same period there were 42 private schools in operation in the Territory, with an enrollment of over 3,674 pupils of both sexes.

The city of Tepic, the capital of the Territory, is situated on the banks of the Tepic River at an elevation of 953 meters above the level of the sea and contains more than 15,488 inhabitants. It has some fine buildings, such as the Calderón theater, the penitentiary, the Government palace, a handsome cathedral, and a number of fine churches and other public edifices. The city possesses a Chamber of Commerce and several small but attractive parks, the most noted of which are Hernán Cortés and Hidalgo. Beautiful tropical and subtropical flowers and plants adorn the public parks and grow luxuriantly in the private gardens of the city. The climate, though somewhat warm in summer, is salubrious and healthful, and with better transportation facilities the city would undoubtedly rapidly increase in population and commercial importance.

List of the principal cities and towns of México, with their population, according to the census of 1900.

City or town.	State.	Population.
México	Federal District	344,721
Guadalajara	Jalisco	101,208
Puebla	Puebla	93,521
León	Guanajuato	63,263
Monterrey	Nuevo León	62,266
San Luis Potosí	San Luis Potosí	61,019
Mérida	Yucatán	43,630
Guanajuato	Guanajuato	41,486
Pachuca	Hidalgo	37,487
Morelia	Michoacán	37,278
Aguascalientes	Aguascalientes	35,052
Oaxaca	Oaxaca	35,049
Querétaro	Querétaro	33,152
Orizaba	Veracruz	32,894
Zacatecas	Zacatecas	32,856
Durango	Durango	31,092
Chihuahua	Chihuahua	30,405
Veracruz	Veracruz	29,164
Toluca	México	25,904
Celaya	Guanajuato	25,565
Saltillo	Coahuila	23,996
Colima	Colima	20,698
Xalapa	Veracruz	20,388
Irapuato	Guanajuato	19,640
Tacubaya	Federal District	18,342
Mazatlán	Sinaloa	17,852
Ciudad Guzmán	Jalisco	17,596
Campeche	Campeche	17,109
Tampico	Tamaulipas	16,313
Lagos	Jalisco	15,999
Tepic	Tepic	15,488
Silao	Guanajuato	15,355
Parral	Chihuahua	14,748
Matehuala	San Luis Potosí	14,205
Torreón	Coahuila	13,845
Salamanca	Guanajuato	13,583
Valle de Santiago	....do	12,660
Zacapoaxtla	Puebla	12,248
Sombrerete	Zacatecas	11,954
Porfirio Díaz	Guanajuato	11,751
Teziutlán	Puebla	11,625
Juchitán	Oaxaca	11,538
Colonia Morelos	Federal District	11,059
Zacatlán	Puebla	10,928
San Francisco del Rincón	Guanajuato	10,904
Xochimilco	Federal District	10,712
Hermosillo	Sonora	10,613
San Miguel Allende	Guanajuato	10,547
San Juan Bautista	Tabasco	10,543
Salvatierra	Guanajuato	10,393
Tehuantepec	Oaxaca	10,386
Culiacán	Sinaloa	10,380
Victoria	Tamaulipas	10,086
Real del Monte	Hidalgo	10,008

List of the principal cities and towns of México, with their population, according to the census of 1900—Continued.

City or town.	State.	Population.
Tenancingo	México	9,891
Tlatlauquitepec	Puebla	9,829
Uruapán	Michoacán	9,808
San Luis de la Paz	Guanajuato	9,768
Cuernavaca	Morelos	9,584
Ciudad Jiménez	Chihuahua	9,318
Atlixco	Puebla	9,219
San Pedro	Coahuila	8,997
Teocaltiche	Jalisco	8,881
San Andrés Tuxtla	Veracruz	8,669
Guaymas	Sonora	8,648
Coatepec	Veracruz	8,539
Rosario	Sinaloa	8,448
Santa María del Río	San Luis Potosí	8,440
Ciudad García	Zacatecas	8,374
Matamoros	Tamaulipas	8,347
Acámbaro	Guanajuato	8,345
Amecameca	México	8,290
Pénjamo	Guanajuato	8,262
Sierra Mojada	Coahuila	8,246
San Juan del Río	Querétaro	8,224
Ciudad Juárez	Chihuahua	8,218
Córdoba	Veracruz	8,136
Tlaxiaco	Oaxaca	8,056
Ameca	Jalisco	7,952
Ciudad Porfirio Díaz	Coahuila	7,888
Sayula	Jalisco	7,883
Ciudad Lerdo	Durango	7,795
Autlán	Jalisco	7,715
Gómez Palacio	Durango	7,680
Pinos	Zacatecas	7,667
Pátzcuaro	Michoacán	7,621
Chilpancingo	Guerrero	7,497
Atzcapotzalco	Federal District	7,494
Iguala	Guerrero	7,463
Sahuayo	Michoacán	7,408
Chilapa	Guerrero	7,399
Mapimí	Durango	7,356
Chalchicomula	Puebla	7,346
Zautla	....do	7,341
Santa Cruz	Guanajuato	7,239
Catorce	San Luis Potosí	7,208
Ixtapalapa	Federal District	7,171
Huatusco	Veracruz	7,158
Tehuacán	Puebla	7,139
La Barca	Jalisco	7,101
Linares	Nuevo León	7,076
Tula	Tamaulipas	6,985
Cholula	Puebla	6,899
Monclova	Coahuila	6,684
Laredo	Tamaulipas	6,548
Zacoalco	Jalisco	6,516
Dolores Hidalgo	Guanajuato	6,490
Huamantla	Tlaxcala	6,478
Parras de la Fuente	Coahuila	6,476
El Carmen	Campeche	6,428
Cuetzalán	Puebla	6,371
Tixtla	Guerrero	6,316
Tlacotalpan	Veracruz	6,314
Zachila	Oaxaca	6,311
Valle de Bravos	México	6,309
Fresnillo	Zacatecas	6,309
Matamoros	Puebla	6,271
Cuautla Morelos	Morelos	6,259
Mixcoac	Federal District	6,186
San Mateo Atenco	México	6,170
Yautepec	Morelos	6,139
Libres	Puebla	6,057
Zitácuaro	Michoacán	6,052
Moroleón	Guanajuato	6,045
Atotonilco el Alto	Jalisco	6,008
Acatlán	Puebla	5,995
Tepatitlán	Jalisco	5,966
Zumpango	México	5,942
Santiago Tuxtla	Veracruz	5,988
Texcoco	México	5,930
Tenango	....do	5,881
Guadalupe Hidalgo	Federal District	5,834
Rioverde	San Luis Potosí	5,759
Zoquitlán	Puebla	5,758
Yuriria	Guanajuato	5,743

List of the principal cities and towns of México, with their population, according to the census of 1900—Continued.

City or town.	State.	Population.
Tlacolula	Oaxaca	5,675
Metepec	México	5,668
Cocula	Jalisco	5,616
Arandas	do	5,608
Lerma	México	5,601
Ciudad González	Guanajuato	5,590
Ticul	Yucatán	5,587
Miahuatlán	Oaxaca	5,564
Chilac	Puebla	5,541
Cotija	Michoacán	5,517
Cortazar	Guanajuato	5,487
Etzatlán	Jalisco	5,473
Tuxpan	Veracruz	5,455
Encarnación de Díaz	Jalisco	5,453
Comonfort	Guanajuato	5,404
Tlatlaya	México	5,298
Colonia Hidalgo	Federal District	5,284
Romita	Guanajuato	5,242
Progreso	Yucatán	5,125
Tacámbaro	Michoacán	5,070
La Paz	Baja California	5,046
La Cañada	Querétaro	5,036
Zacatelco (Santa Inés)	Tlaxcala	5,003
Valladolid	Yucatán	5,000
El Oro	México	4,978
Tetela	Puebla	4,961
Acapulco	Guerrero	4,932
Angangueo	Michoacán	4,868
Milpa Alta	Federal District	4,840
Montemorelos	Nuevo León	4,767
Lampazos	do	4,733
Tlalpan	Federal District	4,732
Camargo	Chihuahua	4,709
Viesca	Coahuila	4,676
Muzquiz	do	4,622
Ometepec	Guerrero	4,597
Tolimán	Querétaro	4,581
Zinapécuaro	Michoacán	4,439
Jiquilpan	do	4,436
Huetamo	do	4,388
Texcaltitlán	México	4,363
Tecamachalco	Puebla	4,350
Cuitzeo de Abasolo	Guanajuato	4,347
Xiutetelco	Puebla	4,315
Villaldama	Nuevo León	4,261
Ocuilán	México	4,257
Magdalena	Federal District	4,208
Coatepec Harinas	México	4,161
Tequisquiapan	Querétaro	4,156
Jiquipilco	México	4,15[illegible]
Coacuilco	Hidalgo	4,143
Canoa	Puebla	4,127
Malinalco	México	4,118
Zacapú	Michoacán	4,097
Sabinas Hidalgo	Nuevo León	4,089
Salamanca	Guanajuato	4,082
Coatepec	México	4,041
Coapancaya	do	4,037
Cadereyta Méndez	Querétaro	4,021

CHAPTER VII.

AGRICULTURE—REVIEW OF THE AGRICULTURAL WEALTH OF THE COUNTRY—PRINCIPAL PRODUCTS, THEIR CULTIVATION, FACILITIES FOR OBTAINING GOVERNMENT LANDS, LAND LAWS, FOREST PRODUCTS.

México has been estimated to contain 14,850 square kilometers of thick forests, 562,160 square kilometers of wooded land, and 1,265,500 square kilometers of uncultivated land.

Frederick A. Ober, in one of his works, draws attention to the fact that the shape of México on the map is that of a cornucopia, and calls the Aztec land a "horn of plenty." Nature has certainly showered her gifts upon the Republic with lavish hand. Her mines are practically inexhaustible, her forests rich in every variety of precious woods, her soil blessed with wonderful fecundity.

Yet with all these natural conditions in their favor the Mexicans for more than two centuries delved into the bowels of the earth in search of silver and gold, and left the fields to lie fallow and the forests untouched, save where their products were needed for purely domestic purposes. The far-seeing Spanish Bishop Zumárraga recognized this when he addressed to the Council of the Indies the words following:

"This country is very rich, very fertile, and thickly populated. It contains gold, silver, copper, tin, precious stones, pearls, dyestuffs, and lands abundantly producing whatever is needed. Nevertheless the Indians are the poorest people in the world, for they have neither wool, hemp, nor flax; nor have they beasts of burden. Wherefore, as bishop of México, I feel bound to beg the gentlemen of the council to make an earnest effort looking to their enjoyment of these benefits. "He who would reap must first sow;" but if, on the contrary, the tilling of the soil is neglected to engage solely in the working of mines the ruin of the country is certain."

It has been stated that had the money which has been spent in mining in the country been invested in agriculture, México would have been at least four times as rich as it is to-day. It has to go to the United States for many of the necessaries of life. The vegetable products of the country are varied in the extreme, owing to the diversified climate. Its productiveness is perhaps unsurpassed by any other country on the globe. The soil produces all the cereals and all the fruits of the United States and Europe, besides those properly incident to the Tropics.

México, enjoying as it does a peculiar geographical situation and orography, may be divided into three agricultural zones or regions, which may be designated, according to their principal productions, as follows:

(1) The sugar cane and rubber region in the lowlands.

(2) The coffee region in the temperate lands.

(3) The region producing the European cereals in the central tablelands.

The most fertile region, that which is almost spontaneously productive, is unquestionably the first, although it is the one which entails the most suffering, owing to the climate and the insects.

In this favored locality the soil is marvelously rich. In official reports to the Department of Promotion appear statements which to those unacquainted with that portion of our continent would seem incredible. An agent of that Department, reporting upon the lands in the southern part of the State of Oaxaca, states that on a sugar plantation in the district of Pochutla there have been found stalks of sugar cane 30 feet in height; that the tobacco plant, which grows wild there, has leaves 25 to 30 inches in length; that along the Toltepec River basin, in the same district, the coffee trees reach the height of large trees and produce 12 pounds to the tree. Certain wild rubber trees yield yearly 10 pounds of the dry substance. The vanilla plant grows wild also, and is excellent in quality. Three crops of corn can be taken from the same field in one year. Beans are so abundant that they are often sold in the neighborhood at the rate of 25 cents per 100 pounds. There are 18 species of bananas and many kinds of palms, one of them yielding a much-sought palm oil. One party imbued with great patience counted 5,000 limes on one wild lime tree.

Along the river bottoms of this well-watered region are millions of acres of land having a layer of humic soil 13 to 16 feet deep.

In this fertile belt are the States of Oaxaca, Chiapas, Tabasco, Campeche, Veracruz, and Guerrero, the principal agricultural products of which are cacao, coffee, sugar cane, corn, beans, and rice, which are abundant, and tobacco, rubber, pepper, and achiote, cultivated on a smaller scale. Rubber, vanilla, pepper, and achiote grow wild also. The yucca plant, from which starch is made, is found here in great quantities, as well as indigo.

Forests of precious woods are encountered throughout this region.

The temperate belt, although affording greater personal comforts in the way of climate and health-giving elements, is poorly watered, and the lands are not so fertile as in the hot region.

The cold zone is less fertile still, due to the absence of streams and the scarcity of rains.

A Mexican authority[a] states that the high lands in the Central

[a] Memoria de la Secretaría de Fomento, 1892–1896. México, 1897, page 101, section V.

Plateau can produce all known varieties of wheat, maize, beans, and tubercles, as well as the agave (maguey) and grapes, and are also adapted to stock raising and the exploitation of forest woods. Rice, sugar cane, tropical fruits, cacao, rubber, and cabinet woods can be produced in the hot region, while in the temperate zone (between 500 and 1,000 meters altitude) coffee grows abundantly, and all the fruits of the earth can be cultivated. The same authority continues:

"Speaking with regard to special districts, it may be affirmed that Oaxaca and Chiapas have no rival (Brazil, even, being included) in the production of excellent grades of coffee in unlimited quantities; Veracruz and Tabasco, on the Gulf side, and the Territory of Tepic, on the Pacific, are actually capable of replacing Cuba in the quality of its tobacco and the bulk of the product; Michoacán in one section, and Chihuahua, Sonora, Coahuila, and Tamaulipas in another, could supply food for millions of cattle, and Durango, Jalisco, Guanajuato, Puebla, and the State of México are capable of raising corn and wheat in almost unlimited areas, and of supplying foreign markets with a large portion of their articles of consumption from cold and temperate zones, and also with some products of the Tropics. Should we add to these the specialties of certain regions, such as Yucatán for henequén or hemp, Tlaxcala and Puebla for maguey (agave), Tamaulipas for ixtle, Coahuila for vines, and Soconusco for cacao, an approximate idea may be obtained of the incalculable importance of México as an agricultural country. Notwithstanding this, it may be said that national agriculture, even in the face of its recent progress, is yet in its infancy and that the soil has only been cultivated on a very limited scale. Neither the proportion between the area now under cultivation and the arable land, the methods, machinery, and implements now employed in the fields, nor the methods now in use for the exploitation and preparation of certain agricultural products are, in general terms, satisfactory. Our export trade is almost nihil, save for products as valuable as coffee and fruits, or as cheaply produced as henequén, or as near the centers of consumption as cattle; and even those mentioned as exported in the largest quantities are not as extensively cultivated as is desirable, nor as cheaply as the country would permit."

There are two main causes for this state of affairs—lack of laborers and of means of communication—both restricting consumption to an extent which necessarily limits the variety of production, and giving preference to ordinary products over those which are finer and more valuable. The mountainous and broken formation of the country has always been, and is still to a certain extent, an obstacle to rapid and economic transportation of merchandise, as it hinders the establishment of permanent currents of traffic, either by land or water, and deprives the agriculturist of the advantages of natural irrigation in certain regions, which are for this reason arid and impassable deserts.

STRAWBERRY PICKING IN DECEMBER, CUERNAVACA, STATE OF MORELOS.

The authority quoted adds that another factor in the slow development of agriculture in the country has been the ignorance of the farming population in the matter of the preparation of the soil and the use of fertilizers and other improved methods of cultivation.

The Government of México has shown a decided interest in improving these conditions, and for several years the Department of Promotion has been endeavoring to disseminate among the agricultural classes information tending to educate them, teaching them improved and scientific methods of cultivation, irrigation, fertilization, and drainage of the soil, and calling their attention to those products which could be advantageously cultivated in the different zones of the Republic. With this object in view, the Department issues a monthly bulletin of agriculture, mining, and industries, and publishes from time to time important works on special subjects, which are extensively circulated among the agriculturiste. The results accomplished by these publications have been most favorable to the agricultural interests of the country, so far having occasioned the establishment and development of the culture of the grape and other fruits and of forage plants, and also the introduction of apiculture and sericulture. In order to further the agricultural interests of the Republic, the Department has imported, for gratuitous distribution among the most advanced agriculturists, seeds and plants, and has also encouraged agricultural fairs and expositions. The distribution began with vine shoots and olive-tree slips and other plants, the cultivation of which is giving excellent results. The cultivation of the grape has received especial impetus in the States of Coahuila, Chihuahua, and Guanajuato. President Diaz, in his message to Congress April 1, 1903, refers to agriculture in the following language:

"National agriculture continues to receive aid from the federation by means of the free distribution of seeds for new cultures or for the extension of cultures already in exploitation, such as the distribution of slips of the grapevine, which are given away with profusion, of seeds of the chaparro salado, Sumatran tobacco, giant corn, jute, huayule, and some others. The exploitation of national lands has increased, owing to the grants made, which embrace 419,000 hectares."

At the beginning of 1892 there were imported 1,030,000 shoots of the vine (simple) and 11,000 with roots, which were distributed among the States of Coahuila, Chihuahua, and other points on the Central Plateau and the south of the Republic. This was attended with excellent results, and toward the end of the fiscal year 1893 shoots to the number of 3,500,000 were imported, principally from Lower California, together with 72,000 olive slips and 16,000 other fruit-bearing trees. The distribution has continued, the shoots and slips of trees already acclimated being also used for the purpose.

In certain localities the cork tree (*Quercus suber*) has been introduced, as well as the "Choro-gi" (*Hachys tubifera*), an excellent tuber of the potato family indigenous to Germany. Seeds of the fodder plant called *Zacatón de Guinea* have also been imported and distributed. This plant requires but little care and irrigation, and its cultivation on Mexican soil has been very successful. Seeds of the "Riga" flax have been imported and distributed with a view to encouraging the cultivation of the plant and the establishment of the industries derived from its exploitation.

For the purpose of establishing the silkworm industry in the country, seeds of the best varieties of the mulberry tree for gratuitous distribution were imported from Italy, the results so far obtained being satisfactory. Chinese and Japanese cocoons were ordered from San Francisco, Cal., but the latter varieties were not obtainable. Cocoons of a good quality have been imported from France and distributed gratis. The results obtained in this branch of industry were shown at the Sericultural Exposition held in Irapuato in 1895, when the quantity and quality of the Mexican product attracted great attention. The silk industry may therefore now be regarded as existent in the country, its development having been noteworthy, and the product remarkable for beauty and finish. Distribution has also been made, among such agriculturists as applied for them, of seeds of Kafir, tobacco, sugar cane, agave, and flax.

The efforts of the Department to promote the agricultural interests of the country have not been confined to the importation and distribution of seeds and plants. Research and investigation have been extended to various industries, among others the cultivation of sugar cane and the manufacture of its products; also, apiculture and the cultivation of coffee, cotton, sesamum or benne seed, leguminous plants, and tubers have received attention. Frequent studies have been made of the diseases and plagues affecting certain plants, and the results have been published and extensively circulated among interested parties.

The preservation of the national forests, their replanting, and methodical exploitation, have been matters of interest and investigation on the part of the Department of Promotion, as the indiscriminate felling of trees at all seasons was gradually destroying the forests; this being especially the case since the advent of railroads and the increased number of industrial establishments using timber instead of iron as constructive material, and wood instead of coal as fuel, the latter combustible not being obtainable at a fair price in sufficient quantities. A law has been enacted on this subject, the regulations stating in detail the duties of the officers appointed by the Government to the care of the forests; the rules and principles to which the exploitation of the forests and their products are subjected; the rules to be followed in making contracts and in cutting down the trees, and also creating a

reservation of national lands for forestry, allotting 2,311,445 hectares to the State of Chihuahua and 203,635 to the State of Chiapas.

With the same object of fostering the agricultural interests of the country, several agricultural expositions have been very successfully held and prizes have been awarded to the best exhibitors, and fairs for the exhibition of cattle, implements, machinery, agricultural products in general, flowers, fishes, fruits, etc., have contributed to the same ends. During these fairs the plan of giving lectures on several topics was adopted, viz, on the usefulness of stock raising; the cross-breeding and acclimatization of cattle; the usefulness and value of agricultural machinery; on sericulture, horticulture, and other important subjects.

One of the most important problems to be solved affecting the rapid development of agriculture in México is the lack of proper irrigation, which can only be compared in magnitude to the scarcity of labor. Mexican territory, owing to its topography, has no natural irrigation. The land rises abruptly from the coast to a habitable altitude of over 3,000 meters, thus creating a serious and insurmountable obstacle both to the retention and gradual absorption of the rain waters which are precipitated over the rough surface of the land, passing with great rapidity over the fields and river beds in their course to the sea, leaving behind a deplorable and ruinous drought, and in some places an almost perpetual aridity. An extended rainy season is of especial necessity to the profitable cultivation of the soil in all the central table-land, the cold region, and in a large portion of the temperate region, but when the rainfall is scanty, as is the case in extensive sections of the northern frontier and in other regions, viz, the States of San Luis Potosí and Zacatecas, or when there is any alteration in its period, the crops are lost, the cattle suffer and the consequences are felt in all other industries. Under these circumstances, the Mexican Government realized that a matter of such vital importance could not be left entirely to private initiative, and therefore framed a law bearing date of June 5, 1888, authorizing the Executive to grant concessions, either to private parties or to companies, for the use of the waters of the Republic for irrigation purposes or as motive power in industries.

The privileges granted by these concessions are:

(1) Exemption for five years from all Federal taxes, the stamp tax excepted, on all moneys invested in the survey, construction, and repairs of the works mentioned in the concession.

(2) The introduction, free of import duties, for the first time only, of the machinery, scientific instruments, and necessary apparatus for the survey, construction, and exploitation of said works.

(3) The right to occupy gratuitously the public and national lands for the passage of canals and for the construction of dams or dikes and reservoirs.

(4) The right to expropriate for public utility any lands belonging

to private parties, indemnification being previously made on the same basis as that governing railroad concessions.

The concessionaires are under the following obligations:

(1) To make a deposit or surety in bonds of the public debt.

(2) To submit for the approval of the Department of Promotion the plans, outlines, and reports describing the work.

(3) To respect the rights of third parties, submitting any differences to the action of the courts, and to admit and defray the expenses of any inspecting engineer appointed by the Executive.

The law also authorizes the Executive to grant free entry into the country of the machinery and apparatus necessary to the employ of the waters, either for agricultural or industrial purposes, if the concession has been granted by a State, provided the companies give security for the performance of the work in accordance with the rules and limitations established by the Federal Executive. On the 18th of September, 1896, this law was regulated by another, which has given excellent results, many of the old concessionaires having taken advantage of its provisions. These laws have been framed not only to provide for the irrigation of the lands, but also for the use of the water as motive power, thus opening a new and extended future to the industrial progress of the Republic.

PRINCIPAL PRODUCTS.

Cereals.—Corn, wheat, barley, and rice, in the order given, are the principal cereals cultivated in México.

Corn.—This product is an eminently Mexican staple, serving as nutriment for man and beast and being the principal article of food for the majority of the inhabitants, who consume it in the form of cakes called *tortillas*. According to the figures given by the "Anuario Estadístico" for 1901 and 1902, the production of corn from 1897 to 1901, inclusive, was as follows:

Year.	Production.	Value.	Year.	Production.	Value.
	Hectoliters.			*Hectoliters.*	
1897	42,954,684	$87,282,671	1900	32,492,489	$87,801,928
1898	39,238,300	82,408,009	1901	32,984,757	103,159,027
1899	32,927,278	71,807,205			

The following figures show the increase in price per hectoliter:[a]

1897	$2.02	1900	$2.65
1898	2.09	1901	3.13
1899	2.14		

The total production for the year 1901–2, according to the same authority, amounted to 27,521,808 hectoliters, valued at $78,411,844.

Wheat.—At the time of the conquest, according to the historian Bancroft,[b] the only European cereal raised in México to any extent

[a] A hectoliter is equivalent to 2.8379 bushels.

[b] History of México, Vol. III, Chap. XXIX, p. 611, 1883.

was wheat, and although the climatic conditions were propitious, the lack of moisture, which could only be overcome by irrigation, would frequently hinder its cultivation. Notwithstanding this drawback, the yield exceeded the average returns obtained in Europe, being, in some instances, as high as seventy or eighty fold. One of the varieties, which was cultivated chiefly in the neighborhood of Puebla, and called *trigo blanquillo*, was remarkable for its abundant yield. In 1677 its cultivation was forbidden by a decree of the Viceroy and "Audiencia" as injurious to health, but it was resumed in 1692.

The transportation facilities offered by the great American railroad systems has given great impetus to the raising of this grain, and México is becoming a wheat-growing country. Wheat grows on the plateau of México at an elevation of from 6,000 to 9,000 feet above sea level and between the eighteenth and twenty-fourth parallels of latitude. The area best adapted to its cultivation comprises some 52,000 square miles, over one-third of which could be planted in wheat without serious detriment to the other agricultural interests of the country. This land is situated in the States of Michoacán, Jalisco, Guanajuato, Aguascalientes, San Luis Potosí, and Querétaro.

The Mexican plan of cultivation makes it possible to take off the land three crops every two years—one crop of wheat and two crops of corn. The average yield of wheat per acre is about 20 bushels and of corn about 50 bushels on irrigated soils and about 30 to 35 on dry lands. These are considered conservative figures. Were this wheat area cultivated to its fullest capacity, the wheat and corn yield of one-third of the 52,000 square miles of suitable lands would be: Wheat, 110,000,000 bushels, and corn, 440,000,000 bushels per year, according to a conservative estimate made in 1883. This immense yield would all be available for foreign markets, as the home consumption could be always provided for by the outlying lands. Since the date of this estimate, improved machinery and more systematic treatment of the soil have considerably increased the yield of the lands devoted to the cultivation of the cereals mentioned, which are by no means all that could be utilized in this way.

Wheat in México is grown entirely in the table-lands and in places where irrigation is possible. Where the haciendas are irrigated by the more modern method of extensive irrigating canals with small streams, and where the elevation of the local irrigation ditch does not exceed 8 or 10 inches, the reapers pass over these ridges and they do not interfere with the working of the machine.

The number of modern flour mills in the Republic is estimated to be about forty. The largest mill using modern machinery is located in Toluca, in the State of México, and has an output of 500 kilos per day. There is under construction in the City of México a mill a with a

capacity of 600 kilos a day. In Guadalajara, Torreón, Puebla, Celaya, Guanajuato, Chihuahua, Morelia, and Orizaba are mills using modern machinery with a capacity of from 75 to 100 kilos per day. In the city of Auguascalientes, San Luis Potosí, there are several small mills, with an average capacity of 50 kilos per day. In Monterey there is one mill with a capacity of 100 kilos per day.

Mexican wheat is small and hard, and when properly milled makes good flour. Specimens of this wheat exhibited at the Centennial Exposition at Philadelphia in 1876 took the first prize.

There are no official figures showing the production of flour in México. However there were 4,000,000 kilos imported into the Republic in 1902 at a nominal value of $130,000, and 3,500,000 kilos of wheat, with a nominal value of $150,000. The supply of white flour is far from equal to the demand, and it is due to this fact that the duty was taken off the wheat so that it might be imported and given to the consumer at a reasonable price.

The railway companies, at the request of the Government, have reduced the freight rate something like 16 per cent on wheat importations. The demand for white flour has increased so much that even the small farmers have taken to growing it for sale instead of corn, which was formerly the custom.

The imports of wheat from the United States amounted in 1901 to $1,498. In November, 1902, the customs duty was reduced from $5 to 50 cents silver per 100 kilos (220 pounds) and the importation from the United States increased in consequence to $731,336 in 1902 and to $951,572 in 1903.

Mexican official statistics for 1901–2 show that the total production of wheat for that year amounted to 229,892,752 kilos, valued at $24,522,429. The principal States producing this grain were as follows:

	Kilos.	Value.
Michoacán	35,521,640	$2,470,219
Sonora	34,778,728	2,967,151
Guanajuato	30,581,297	2,493,372
Puebla	22,225,517	1,912,473
Coahuila	18,453,439	1,435,079
México	15,225,297	7,241,541
Durango	14,980,850	1,176,220
Jalisco	13,204,823	998,000
Querétaro	12,765,359	858,470

From 1898 to 1902, inclusive, the production of wheat has been increasing, except in 1901, as shown in these figures:

Year.	Kilos.	Value.
1898	239,186,186	$16,509,735
1899	252,749,505	17,607,924
1900	338,263,902	22,770,056
1901	327,159,027	23,800,122
1902	329,892,752	24,522,429

Barley.—All the States of the Republic, with the exception of Campeche, Colima, Guerrero, Tabasco, and Yucatán, produce barley, the total production for 1901–2 being officially given at 2,130,118 kilos, valued at $4,916,523, Puebla and México being the largest producers.

Rice.—For the year above mentioned the production of rice amounted to 18,126,070 kilos, with a valuation of $2,540,233, Morelos, Michoacán, and Colima being the largest producers out of 15 States.

The following table from the "Anuario Estadístico" for 1902 shows the total cereal production of the country:

States.	Rice.		Barley.		Corn.		Wheat.	
	Kilos.	Value.	Hectoliters.	Value.	Hectoliters.	Value.	Kilos.	Value.
Aguascalientes	.....	.....	1,189	$2,764	1,354,450	$4,063,350	1,767,240	$208,755
Baja California	.....	.....	1,352	6,525	6,302	22,912	638,550	46,187
Campeche	45,300	$7,248	.....	.....	80,980	380,880	.....	.....
Coahuila	1,150	172	26,052	66,115	543,431	2,135,694	18,453,439	1,435,079
Colima	2,075,400	440,640	.....	.....	631,694	1,141,917	.....	.....
Chiapas	810,727	137,702	180	675	656,985	1,519,796	676,179	76,617
Distrito Federal	.....	.....	66,414	163,287	357,794	1,427,533	3,436,610	613,789
Durango	.....	.....	6,760	21,250	1,584,226	4,664,548	14,930,850	1,176,220
Guanajuato	.....	.....	42,985	92,760	1,761,125	5,449,805	30,581,297	2,493,372
Guerrero	467,231	62,789	.....	.....	570,964	1,017,966	805	60
Hidalgo	31,329	15,583	229,683	468,866	905,680	2,057,087	2,701,955	193,525
Jalisco	503,796	98,285	52,149	133,736	4,050,963	9,844,366	13,204,823	998,002
México	60,000	9,000	481,727	1,091,651	1,900,739	6,374,172	15,255,297	7,241,541
Michoacán	4,410,250	622,388	81,132	164,192	1,807,187	4,864,796	35,521,640	2,470,219
Morelos	5,620,447	769,450	894	2,365	289,218	829,899	79,954	6,949
Nuevo León	.....	.....	26,986	56,929	270,343	1,032,128	249,085	18,585
Oaxaca	36,978	5,582	17,549	34,906	1,978,434	6,942,932	7,858,708	498,905
Puebla	2,112,652	109,019	595,517	1,328,180	2,224,602	6,332,746	22,225,517	1,912,473
Querétaro	.....	.....	23,003	52,006	626,484	2,041,694	12,765,359	858,470
San Luis Potosí	59,197	12,485	107,070	319,480	1,532,771	5,247,437	666,263	57,683
Sinaloa	.....	.....	160	420	955,225	1,653,087	225,900	25,442
Sonora	.....	.....	4,219	21,095	359,233	973,660	34,778,728	2,967,151
Tabasco	1,058,113	107,430	.....	.....	379,747	1,146,012	.....	.....
Tamaulipas	.....	.....	9,700	9,700	404,868	1,146,763	.....	.....
Tepic	838,500	142,460	4,500	15,450	782,886	1,352,936	14,800	1,184
Tlaxcala	.....	.....	315,350	710,556	237,775	886,977	9,386,064	844,694
Yucatán	.....	.....	.....	.....	171,391	1,209,747	.....	.....
Zacatecas	.....	.....	85,547	153,615	1,096,311	2,651,004	4,473,689	377,527
Total	18,126,070	2,540,233	2,130,118	4,916,523	27,521,808	78,411,844	229,892,752	24,522,429

Coffee.—Mexican coffee is of excellent quality; that produced in Uruápam (Michoacán) and in the State of Colima has been classed with Mocha. It is claimed that it is possible to so increase the raising of coffee that México can supply more of the aromatic bean to the markets of the world than all other countries combined, save only Brazil. The immense area adapted to its cultivation may be estimated when it is known that it grows both in the hot and temperate belts. Heretofore México occupied the fourth place among the countries importing coffee into the United States, which is her best market. Now, it is asserted, she immediately follows Brazil, which stands first. Within the last ten years this Mexican product has risen from the fifth to the third place in point of quality.

The Mexican consul in Antwerp, Belgium, in a report states that from the 1st of January, 1904, all Belgian duties on Mexican coffee will be abolished, and that the duty on roasted coffee will be 10 francs

per 100 kilograms. The consul adds that Mexican coffee is coming rapidly into favor in Belgium. It may be added that requests for Mexican coffee are rapidly increasing in Germany, France, and England, while in the United States there is a great demand, and a number of concerns are giving their entire attention to the Mexican berry. As a result, coffee raising, which has been somewhat stagnant for the past few years, is enjoying a revival, and a number of old-time planters are preparing lands for setting out new orchards.

Coffee is not indigenous to the country, but it was originally brought from the West Indies about 1790. Still, it was not until 1818 that the plant was properly cultivated, when Don Juan A. Gómez, called the Benefactor of Córdoba, demonstrated that México had the soil and climate essential to the cultivation of coffee. The berry is mostly raised in Colima, Oaxaca, Chiapas, Guerrero, Jalisco, México, Michoacán, Morelos, San Luis Potosí, Tabasco, and Veracruz.[a]

[a] "The coffee plant mostly cultivated in México is a subvariety of the Mocha, or *Coffea arabica*. This is an evergreen, partaking more of the nature of a shrub, which in a state of cultivation varies in height from 5 to 7 feet. The range of this species is at elevations of from 1,000 to 5,000 feet above sea level, south of latitude 22° north, where the temperature does not fall below 55° F.; still, the most favorable climate for it would be where the temperature does not fall below 60° nor rise above 80° in the shade. As to humidity, there should be from 75 to 150 inches of rain during the year, and the plant should be irrigated during the dry season, if required. The myrtle kind, which is considered as second in quality, is also extensively cultivated. It is very similar to the Java, and is distinguished from the Mocha variety by the leaf being larger and the corolla smaller. This plant is hardier than the Mocha kind and will stand higher temperature; it is mostly cultivated in the Córdoba district. It will thrive well at an elevation of from 500 to 3,000 feet above sea level. It is the opinion of the writer that Liberian coffee would thrive in the hot climates of Yucatán, Campeche, Tabasco, and Veracruz. This is the hardiest of all the coffee trees adapted to the climates of México, and will stand a very high temperature.

"As the coffee tree has a long taproot, it will thrive better on land where the soil is deep. The best soil in México is a well-drained, loamy one, either of a virgin mountainous composition, or of a volcanic nature, rich in humus. A rocky soil, where the earth is deep between the rocks, is very suitable, and less manuring is then required for the plants, as the rocks are continually adding to the soil by the decomposing action of the air, rain, and other natural forces. The climate most adaptable to coffee in México is that found in the mountainous regions, with a range of temperature from 55° to 86° F. The best coffee is grown at elevations varying from 2,200 to 4,500 feet above the sea, in sections south of Veracruz; but in locations below latitude 21° north, the north limit of the coffee zone on the Gulf side, the climate being cooler, the bush requires lower elevations, ranging from 600 to 3,000 feet. The plant is, however, cultivated by some planters at much lower levels, and even within a few miles from the seashore—for instance, in Misantla, Acayucán, Minatitlán, and Tuxtla, Veracruz; and in Cárdenas, Comalcalco, Cunduacán, Nacayuca, and San Juan Bautista, Tabasco. An extremely wet climate is not favorable to the coffee plant, and it will not thrive in very exposed situations. If proper aspect as regards sun and winds can not be obtained, the exposure can nearly always be modified by shelter belts of trees. On the Pacific side the prevailing south winds must be avoided at low elevations, and on this side the tree can be planted at much

Mr. Matias Romero, who for many years devoted his attention to coffee culture, estimated the results of coffee raising as follows:

	Cost of planting a tree.	Annual product of a tree.	Expense of cultivating one tree.	Net profit.
		Pounds.		*Per cent.*
In India	$0.20½	0.4563	$0.04	25.49
In Ceylon	.23	.4563	.03½	25.15
In México	.12	1	.05	90

Romero's averages have been considered too high as regards the cost of cultivation and too low as regards the annual yield. In an official publication[a] appears the statement that in the State of Chiapas, where the land is good, and care and economy have been exercised in the cultivation, the following have been the results:

Annual expense of cultivation (one tree)		$0.01
Annual yield for each tree	pounds..	10

In the State of Oaxaca on one plantation, 21 months after planting, the trees yielded 3 pounds of dry coffee each.

In the District of Choápam, of the same State, the average crop is 6 pounds of coffee for each tree, and there are trees producing 25 pounds of dry coffee a year. Romero takes 1 pound as the average yield of Mexican coffee trees. In arriving at this figure he takes into consideration all kinds of coffee plantations, those laid out in poor localities, in poor seasons, and improperly cultivated; but it appears to be pretty well settled that good lands, cultivated under proper conditions, will render crops of from 4 to 10 pounds per tree. Col. E. C. More, late United States Consul-General to México, agrees with Romero in that, under present conditions, the profits of coffee raising are 90 per cent per annum; but that they differ largely in the several belts devoted to the culture of the bean is evidenced by the fact that an American coffee expert of Fortín and Córdoba, State of Veracruz, states that the profits reach 150 per cent. The bean sells, according

higher elevations, as the range which branches off at Jalisco and joins the Toluca Mountain and the Popocatepetl Peak breaks off the cold north winds and shelters the regions below it. As to direct sun exposure, when it is desirable to take advantage of the heat at high elevations it is always convenient to acquire, as far as possible, a southern exposure; but where the elevation is low and the temperature is high such an exposure would be injurious to the plant, in which case it is better to procure an eastern exposure. Generally, the action of the rains modifies the temperature in the Tropics, and at elevations between 2,000 and 4,500 feet above sea level clouds gather along the mountains almost every day before the rays of the noon sun bear their strong influence in those localities. On the Gulf side the trees that have an eastern sun exposure, so that the sun strikes them during the morning, thrive better and yield more."—(Production of coffee in México, U. S. Consular Reports, Vol. LII, Sept., 1896, pp. 103–121.)

[a] Los Estados Unidos Mexicanos, R. de Zayas Enriquez, México, 1893, p. 458.

to class, at from $24 to $32 per hundredweight, Mexican money. In the Huasteca Potosina section of Veracruz coffee planting during the past three years has increased at the rate of 60 per cent a year. Generally it costs $7 silver to raise, pick, clean, and sack a hundredweight of coffee. The selling price averages $27 per hundredweight on the ground. The product per acre is from 250 to 500 pounds. The value of the exports to all countries in 1897 was $10,649,119.

The first recorded exportation of coffee from México to the United States was in 1825, amounting in value to $216,850. The same country furnished the latter during the fiscal year ending June 30, 1898, 34,721,168 pounds; in 1901, 60,459,865 pounds, and in 1903, 22,207,086 pounds. Latest available Mexican statistics for 1902 show that the exports of coffee to all parts of the world amounted to 22,565,183 kilos, valued at $10,552,313, the United States being the largest consumer, with 14,592,755 kilos, valued at $6,826,250. Germany occupies the next place, with over 3,500,000 kilos, and then follow France, with nearly 2,000,000, and England, with over 1,700,000 kilos. During the first six months of 1902–3 the total exports of this grain is officially given in the Boletín de Estadística Fiscal at 4,445,615 kilos, with a declared invoice value of $2,050,273.

The number of American firms engaged in coffee planting in México is, according to a report of Consul-General Barlow,[a] as follows: Chiapas, 5; Oaxaca, 13; Puebla, 19; Tabasco, 2; Tepic, 1, and Veracruz, 15—in all 55. Many of the American firms ship their coffee to St. Louis, Mo., where it is roasted, ground, and stored for sale. Much of the product of Oaxaca goes directly to London, where it enters into competition with the best grades of the South American product.

The "Anuario Estadístico" for 1901–2 gives the following figures for the production of coffee in the fiscal year named, viz, 9,983,546 kilos, valued at $2,799,317—the largest producer being the State of Chiapas, with 4,330,818 kilos, for $1,143,228, and the State of Oaxaca next with 1,800,523 kilos, at over $500,000. The same authority quotes the following figures for the production of the berry for the calendar years named:

Year.	Kilos.	Value.
1898	16,363,230	$4,600,680
1899	37,609,264	11,065,657
1900	21,068,123	6,048,509
1901	27,424,415	8,733,778
1902	9,983,546	2,799,317
Total	112,468,578	33,247,941

Tobacco.—The tobacco plant (the yetl of the Aztecs) is indigenous to México. Its cultivation and use soon became known among the

[a] Commercial Relations of the United States, 1902, Vol. I.

COFFEE GRADING.

Spaniards and was not seriously restricted for nearly two centuries after the conquest. In 1764 the Crown appropriated the right to the sale and manufacture of the plant, its culture being confined to the districts of Orizaba, Córdoba, Huatusco, and Zongolica, severe penalties being fixed for its cultivation elsewhere. The product was purchased by the Government at a stipulated price, which in turn sold the leaf at a profit of about 200 per cent. The revenues derived from this monopoly in 1783 amounted to $777,651; in 1792, to $684,109; in 1794, to $773,442, and in 1801–2, about $4,000,000 silver. Under the Spanish régime factories were established in several cities, the principal being situated in México and Querétaro, each employing about 7,000 persons of both sexes, with an aggregate pay roll of more than $700,000 a year. The annual product of these establishments amounted to nearly $7,500,000, about one-half of which belonged to the Crown.

In 1868 several foreign cultivators and manufacturers, principally Cuban, went to México, where they began to cultivate the plant on an extensive scale. Not a little of the success attained in this industry is due to Frenchmen, as a French writer, Louis Lejeune, in a pamphlet on the subject, first drew attention to the fact that the tobacco grown in the upper valley of the Papaloapán River produced leaves as fine and silky and even more aromatic than those of the Vuelta Abajo, in Cuba. In his pamphlet Mr. Lejeune made an elaborate comparison of the relative cost of starting a tobacco plantation in Cuba and in México, showing that with silver at par, as was the case at the time of his writing, the expenses in México were only about one-half as great as in Cuba, not taking into account the price of land and the cost of transportation. At the Paris Exposition (1889) the Mexican product obtained gold, silver, and bronze medals, being considered equal to, if not the superior, of Habana tobacco. In 1894 and 1895, "La Regie," a department created in France to regulate the importation and traffic of tobacco, began to accept the Mexican product.

The Mexican tobacco has a flavor peculiarly its own, and it grows upon one, and where it has been used for any length of time, as upon the western coast of the United States, it is rapidly superseding the Cuban article.

Tobacco is raised along the mountain country lying between Victoria, State of Tamaulipas, and Campeche, capital of the State of the same name, also on the Pacific slope of the States of Chiapas, Oaxaca, Guerrero, Michoacán, Jalisco, Colima, Sonora, and the Territory of Tepic. It is likewise cultivated in the interior districts of Morelos, Michoacán, Oaxaca, Veracruz, Tamaulipas, Tabasco, Guerrero, Jalisco, Colima, and the Territory last above named. In addition to the parts named, the Government maps show 113 different cantons, or small districts, where the weed is now being cultivated. In the virgin

valleys along the rivers of the States on the Pacific slope the plant may find the elements which best meet its requirements.

In order to produce an aromatic and mild as well as large and fine leaf it is necessary that the soil should be sandy, well charged with organic vegetable matter in decomposition, and contain oxides of iron and aluminum, and also lime, although this is not an indispensable requisite. This is the soil México provides, and it is so deep that it is not necessary to plant a crop of corn after the tobacco crop, planters instead raising a second or seedling crop of tobacco, which furnishes the small and mild leaf used in cigarette making. The extent of the tobacco region is immense, probably one hundred times that of the same region in Cuba.

As a material for "fillers" Mexican tobacco is unexcelled. Practically no wrapper tobacco is grown in México. The finest Mexican cigars go to Habana, where they sell at $1.67 per pound. All of the Central American and some of the South American countries buy these cigars, paying an average of $1.05 a pound.

Statistics for the tobacco production of México during the fiscal year 1902–3, published in the "Economista Mexicano" of November 28, 1903, show the following figures:

Year.	Cigarettes.	Cigars, cut.	Cigars, perilla.	Rapé.	Fine cut, sifted.	Fine cut.
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*
1898–99	4,915,780	174,627	432,965	414	22,628	111
1899–1900	5,906,519	236,559	417,931	22	23,625	106
1900–1901	6,974,333	283,472	405,797	16	17,656	459
1901–2	6,203,966	395,510	425,165	9	23,260	1,196
1902–3	7,305,079	393,063	458,021	14	23,951	3,585

A steady increase is observable in all the various forms of manufactured tobacco, except the rapé or snuff, which has almost ceased to be made, the demand being in fact almost nominal. The increase in the cigarettes is very considerable, having almost doubled in the five years under review; the homemade cigarettes have gradually driven the Habana article from the Mexican market, México having formerly been one of the greatest consumers.

The total production of tobacco during 1901–2 is officially given at 3,907,311 kilos, valued at $758,200, the Territory of Tepic being the largest producer with 1,188,700 kilos, at $169,872, all the States of the Republic having contributed, with the exception of Morelos, Querétaro, and Tamaulipas. The total production of the country from 1898 to 1902 is officially quoted at 79,718,221 kilos, valued at $12,351,973.

Exports of manufactured tobacco during 1902 amounted to 236,448 kilos, with a valuation of $650,524, England being the largest importer—157,679 kilos, at $468,968; the United States being second with 18,549 kilos, at $50,601. The next importing countries were Colombia, with 18,500 kilos, in round numbers, at $22,500; Guatemala, 17,800 kilos,

$25,500, and Germany, 15,300 kilos, at $51,500. For the first half of 1902–3, exports were 123,944 kilos, at $353,780.

Exports of leaf tobacco amounted in 1902 to 1,114,326 kilos, at $1,020,479—Germany, Belgium, and the United States being the largest consumers in the order given, as follows:

Country.	Kilos.	Value.
Germany	495,341	$374,337
Belgium	432,262	448,326
United States	130,276	162,771

For the first six months of 1902–3 these exports were 195,332, valued at $200,000.

Mexican leaf tobacco imports for 1902 are officially given at 1,260,186 kilos, valued at $226,190, the United States being represented by 1,251,767 kilos, at $218,025.

Cotton.—Cotton has been cultivated in México from time immemorial. Prior to the advent of the Aztecs in the valley of México their predecessors knew and practiced the art of cotton spinning.

Although México is so thoroughly adapted by soil and climate to the production of this fiber, and although she has an acreage sufficient to produce it in quantities greater than the United States, she is not only not an exporting nation, but actually imports annually about $2,000,000 worth of the staple to supply the demand of her factories. In 1897–98 she imported 21,216,287 pounds from the United States; in 1898–99, 18,064,891 pounds, and in 1903, 33,253,500 pounds, valued at $3,183,430. It has been said that with direct railroad communication from the Pacific coast to the interior the Yaqui River region in Sonora alone would supply that demand, and more.

Cotton is produced on the seaward slopes of both cordilleras, and also in the interior of the country. The great cotton belt is the Laguna district, in the State of Coahuila, which has a length of about 40 miles, is rather narrow, and follows the Nazas River, being almost entirely under cultivation. It is distant about 700 miles from the City of México, and is in railroad communication therewith. Under fair conditions the annual crop will yield $10,000,000 in value.

The principal cotton-producing districts, other than that named above, are: On the Gulf side, the cantons of Cosamaloápam, Tuxtla, Túxpam, Tantoyuca, and Veracruz, in the State of Veracruz. On the Pacific slope, from Sonora to Chiapas. In Sonora, the valleys of the Yaqui and the Mayo; in Sinaloa, the valley of the Fuerte; in Tepic, the valleys of Tepic and Santiago, the fertility of which is astonishing, and in Jalisco, Michoacán, Guerrero, Oaxaca, and Chiapas the production is great, and could, at a small cost, be made enormous. In the central part, Chihuahua, Coahuila, Durango, and Nuevo León are the principal producers.

On the coast of the State of Guerrero the fiber measures 37 millimeters in length; in San Pedro and Lerdo, 35 millimeters; in Veracruz, 34 millimeters; in Guaymas, 30 millimeters; in Tepic, 31 millimeters; in Colima and Oaxaca, 32 millimeters.

The methods of cultivation employed are still rather primitive, the plow until very recently being little used, and nature being left to exercise her agencies unaided. With the intelligent use of improved machinery and a knowledge of advanced methods of cultivation México need never import an ounce of cotton. There are great advantages in the cultivation of Mexican cotton, as the plants continue to bear profitable crops without the use of fertilizers on the soil or the renewal of seed, which is necessary each year in the United States.

"The consumption of raw cotton in México"—says the "Mexican Economist"—"is estimated to be 100,000 bales annually, 50,000 bales of which are produced in the country, principally in the States of Durango and Coahuila. Active efforts are being made throughout the Republic to increase the acreage of cotton under cultivation, inasmuch as there are other places in the Republic exceedingly well suited to its cultivation, such, for instance, as the coast lands of the States of Oaxaca and Guerrero, and the States of Chiapas, Veracruz, Puebla, and Morelos. The price of raw cotton was $31 silver per quintal in 1903. The fiber of the Mexican cotton is longer and stronger than that of the cotton of the United States, but is thinner, less silky, and not as clean as the latter, which fact has given rise to the custom of mixing the American cotton with the Mexican, especially in the manufacture of articles of fine texture."

The production of cotton in México for 1901–2 is given as follows by the "Anuario Estadístico" for that period: 22,529,407 kilos, valued at $8,629,109; Coahuila being credited with the largest amount, viz, 14,073,750 kilos, at $6,666,277; then comes Durango with 4,880,500 kilos, at $1,530,600, and the territory of Tepic with 1,485,800 kilos, valued at $144,080. The total production for the last five calendar years is given as follows by the same authority:

Year.	Kilos.	Values.
1898	45,525,767	$6,872,770
1899	22,487,517	4,679,628
1900	21,795,895	6,148,773
1901	22,364,092	6,447,880
1902	22,529,407	8,629,109
Total	134,702,678	32,778,160

Cotton weaving and spinning is one of the most promising growing industries of México. During the fiscal year 1901–2 there were in the country 93 working factories using 595,728 spindles, 18,222 looms, and 33 printing machines, consuming 27,628,366 kilos of cotton for the pro-

duction of 10,428,532 pieces of woven or printed goods, and 1,879,329 kilos of yarn, the sales declared being $28,780,000.

Imports of raw cotton into México in 1901–2 amounted to 6,475,934 kilos, valued at $1,271,958, as per invoice, and during the first half of 1903 were 9,475,968 kilos, invoiced at $1,816,418. The share of the United States in the raw cotton imports for the calendar year 1902 is represented by 14,879,356 kilos, valued at $2,920,789, according to official Mexican figures.

The "Mexican Investor," December 8, 1902, is authority for the statement that an attempt has been made to utilize in Yucátan two native delicate fibers to substitute cotton in many of its uses. The plants produce cotton of two classes; the smaller one gives a coffee-colored seed and grows and multiplies without special care all the year round; its fiber is thicker than that of the common cotton. The seed of the other plant is of a light-blue color. This plant requires special cultivation and irrigation; the fiber is finer than the other, and as fine as the finest cotton. An agriculturist of San Luis Soyatlan, in the State of Jalisco, who first experimented with these two plants, the same authority states, has distributed seeds all over the hot lands, for which it is most suited.

Cacao (*Theobroma*, in Greek—the food of the gods) is another plant indigenous to México. It has been cultivated by the aborigines from remote times, and from its bean they made their drink *chocolatl* (chocolate), which was considered to have great sustaining virtues, and Cortés, speaking of the general adoption of the beverage by his soldiers, in his first letter to Charles V says: "He who has drunk his cup of chocolate travels a whole day without taking other food."

Ever since chocolate came into general use in Europe, in the latter part of the seventeenth century, the high-grade cacao has been furnished by the States of Tabasco and Chiapas. The Mexican home consumption is very large, yet the production does not meet the demand, which is ever increasing.

The cacao requires a warm and moist atmosphere, the best lands lying between sea level and 1,600 feet above, in localities protected from strong air currents. Although there are many districts in México affording the necessary conditions of climate and soil, the cultivation of the cacao is almost entirely in the hands of the Indians, who raise it on a small scale and carry their crops to market, where they are bought by merchants, who store them away until a sufficient quantity is collected to ship to the large consuming centers. The plant begins bearing three or four years after planting, and usually gives three crops a year, although in some parts of Chiapas four crops have been garnered in a twelvemonth.

A Mexican authority thus estimates the cost of establishing and maintaining a cacao plantation for a period of eight years:

Cost of 100 acres of land	$500
Clearing same for cacao, staking, planting shade trees, cacao, and corn between the rows of the cacao plants, care of corn, and expense of harvesting	1,340
Value of corn crop	1,200
Second year:	
Cost of maintaining plantation and of planting, cultivating, and harvesting corn crop	1,130
Value of corn crop	1,000
Third year:	
Cost of maintaining plantation, raising last crop of corn, and gathering first crop of cacao	1,600
Value of corn and cacao	1,600
Fourth year:	
Cost of maintaining plantation	1,444
300 *cargas*[a] of cacao	7,500
Fifth year, profits	6,000
Sixth year, profits	8,300
Seventh year, profits	10,490
Eighth year, profits	21,000

The plants reach their maximum production the ninth or tenth year, and after the twenty-third year their yield diminishes. The trees are planted about 400 to the acre, and an authority places the average yield of 1,000 trees at 600 pounds. The cacao industry has proven a considerable source of wealth to the State of Tabasco, and it is strange that investors have not recognized its profitableness.

It is asserted by good authority that land well adapted to the raising of cacao plants can be purchased for about $8 an acre, Mexican money, in sections of from 100 to 500 acres.

As the bean of the plant is extensively used in the manufacture of chocolate, and it is utilized in the making of salves for medical use, such as cacao butter, its cultivation offers an inviting field for profitable speculation.

Consul-General Barlow, in his report before quoted, gives a list of American investors in México, wherein it appears that there are 4 firms growing cacao in Tabasco, 1 in Veracruz, 1 in Oaxaca, and 2 in Chiapas. Mexican official figures relative to the production of cacao during 1901–2 give the total production at 3,428,525 kilos, valued at $2,703,628. The principal States producing this bean were Tabasco, 1,869,435 kilos, at $1,551,391, and Chiapas, 1,551,705 kilos, at $1,143,182. The other States given are Colima, Michoacán, Guerrero, and Oaxaca. For the last five years the total production of the country was as follows:

[a] The *carga* here mentioned is equivalent to about 60 pounds.

Year.	Kilos.	Value.
1898	1,362,543	$1,385,267
1899	1,032,437	689,907
1900	1,973,352	1,709,857
1901	1,792,988	1,622,844
1902	3,428,525	2,703,628
Total	9,589,845	8,111,503

Rubber.—The rubber tree grows wild in many parts of México; it abounds in the warm latitudes of the States of Veracruz, Tamaulipas, Tabasco, Guerrero, Oaxaca, Chiapas, Colima, Michoacán, and the Territory of Tepic. Except in isolated cases, the cultivation of the tree has not been seriously undertaken. The natives, not appreciating the value of so important an element in the arboreal vegetation of the country, have been accustomed for many years to extract the milk from the tree, boil it, and take the rubber made into balls to the market without any further preparation or treatment. The natives also chopped down and destroyed great numbers of these trees.

In the Tehuantepec region there are said to be 1,200 square miles of territory susceptible of growing the rubber tree. There it is valuable not only because of its product but also for the good results it gives in furnishing shade to coffee and cacao trees. The tree begins to yield when 6 or 7 years old, but it is not considered advisable to tap until it is 9 or 10 years of age. If the tapping is properly done (once a year, in October and November, for instance) it will produce for twenty-five years. It produces 1 pound of gum when 10 years old and 2½ to 3 pounds when 15 years of age.

The cost of planting and care for the first year is from 4½ to 5 cents, and 1½ to 1¾ cents for cultivation in the subsequent years. On the Isthmus the gum sells for 40 to 60 cents gold per pound, on the plantations.

Romero states[a] that the milk yield of each tree six years after planting is estimated at 6 pounds, which, reduced to rubber, loses about 55 per cent, and he calculates that a plantation of 100,000 trees would produce a net profit at the end of six years, at the prices then prevailing (1871), of $110,880.

The best climate for the culture of the rubber tree is the hottest, and the best land the dampest and the nearest to the seashore or on the low-lying banks of rivers. The tree requires but little labor for its cultivation. An economical method of growing it is to plant the trees as shade for coffee and cacao plantations, rubber itself not requiring the shade, but, on the contrary, experience in México has demonstrated that trees growing in the sun are healthier and better than when protected from its influence. The prevailing opinion

[a] Coffee and India Rubber Culture in Mexico, p. 382. New York, 1898.

among the agriculturists of México seems to be that 2 to 2½ meters from tree to tree on every side is the proper spacing in planting rubber trees. The hardiness of the plant greatly simplifies its culture, thus rendering it proportionately cheap. In the low, hot, damp lands most favorable to its growth the fertility of the soil is so great that the necessary labor may be said to consist solely in weeding the plantations, and as the rubber plant possesses a vitality superior to that of weeds or of any other kind of vegetation, in proportion as the trees grow larger the necessity for weeding becomes less imperative. Another point in determining the success of a plantation is the method employed in tapping the trees. This operation must be performed very carefully, so as not to injure the woody structure beyond the bark, nor must the bark be separated in two portions, thus isolating the upper and lower sections of the tree and preventing the ascent of the sap.

United States Consul W. W. Canada, at Veracruz, under date of January 11, 1904, forwarded the following important information, taken from Mexican sources, to the Department of Commerce and Labor of the United States, which is published in Consular Report No. 1875, of February 12, 1904:

"There are more than 1,500 species of rubber plants or trees, and all of them are intertropical plants. The Mexican rubber tree is of the family of *Castilloa elastica* and is indigenous to the soil. Those desiring to engage in the cultivation of rubber should carefully look into the following points and satisfactorily settle them before investing.

"What is the most favorable climate and what qualities should the soil possess to insure the profitable development of the tree?

"Unfortunately it is impossible to answer definitely and conclusively the greater number of the questions which follow; we can give only the results of our personal experience on a small plantation and such other information as we have collected from various sources. We could answer the preceding question perhaps in this manner:

"What is the best method to pursue when commencing a plantation—plant direct from the seed, transplant the young trees, or plant slips or cuttings?

"The cheapest and most convenient method is to transplant the young trees from a nursery, an indespensable adjunct that should always be proportionate in size to that of a plantation about to be cleared for planting. The young trees should have a height of at least 31.5 inches before this can be done successfully. Planting the seed where the tree is expected to grow is not advisable on account of the greater labor in keeping the soil clear of other growths and consequent expenses incurred. Planting slips or cuttings from trees should never be attempted, as 90 per cent of them will be lost.

"Should the plants have sun or shade? At what distance from each other should trees be set out?

"These points have been in controversy by all authorities on the subject. Some believe that the rays of the sun are beneficial, others that they are injurious, to the plant. However, the opinion of competent persons is that a tree exposed to the rays of the sun develops quickly and produces a larger quantity of rubber, but will also rapidly deteriorate, and it is believed that within three or four years after the tree commences to produce the plantation will be exhausted. Those who maintain that shade is necessary to insure best results claim that the plant will not cease to produce or exhaust itself in less time than from twenty to thirty years. Only practical experience will solve this question, and this has demonstrated the fact that the rays of the sun are necessary for the natural development of the tree, but trees that have already attained a good height give very little product when so exposed. They must have shade, and such as is given by large forest trees left at convenient distances from the rubber trees. Therefore, when clearing the land for a rubber plantation a sufficient number of trees of large growth should not be cut down, but should be left standing at regular distances to secure the necessary shade for the rubber trees.

"The proper distance at which trees ought to be set out from each other is another much-disputed point, and there is no general rule for the guidance of the planter. Trees planted at a distance of 10 feet apart become dwarfed; the trunk thickens and some of them are very slow in attaining to the perfection of others that receive air and nourishment from the soil in abundance. When trees are planted closer than 25 feet apart the loss to the plantation is equivalent to 50 per cent. Some of the trees develop vigorously, while others remain weak and dwarfed and the foliage turns yellow, influenced, as it were, by the larger plants near them.

"What is the nature of the labor to be performed while the trees are growing?

"After the preliminary clearing of the land and also after the young trees have been set out, great care must be exercised to keep the soil free from weeds and other plants. All these should be carefully removed and the ground raked over several times during the first year and at least once a year afterwards. Some authorities advise cutting off the top of the tree when a height of 32 feet 8 inches has been reached. This is believed to cause the trunk of the tree to thicken, as well as the bark. Nature produces the milk in the bark, and in this the sought-for source of profit is found. The planter must apply all his intelligence and give all his attention to the plants until they are fully developed, and it should not be lost sight of that the cultivation of the rubber tree is something entirely new to the agricul-

turist. No one has as yet said the last word on the subject. We are yet in the dark, or in the epoch of study and observation, and only the intelligent planter can possibly discover the secrets of nature.

"After planting, how much time will elapse before a rubber tree will commence to produce?

"Here we have another disputed question. Some say twenty years, others fifteen years, and still others ten years, but the majority seem to agree that at the age of eight years the tree will be in a condition of development to permit of its being tapped for the first time, if the soil, the climate, and the growth of the tree have been good; but if either of these elements has been unfavorable the probability will be that a longer time must elapse before tapping can take place. And, again, practical persons have assured us that under favorable conditions a tree may be fully developed at the age of six years.

"What is the annual production of a tree and what is the best method for extracting the rubber without impoverishing the plant?

"This question, no less important than the others, is also the cause of much controversy and contradictory opinions. Some agriculturists believe that a tree may be tapped without injury once every two months, and made to yield at each operation 6 pounds of rubber, making 36 pounds per year for each tree. Meanwhile, others believe that the tree should be tapped only once a year to produce 6 pounds. Still others think it more advantageous to the planter to extract the juice once every two years, believing that the production will be greater than by tapping every two months. Among those who are posted it is agreed that a tree with a trunk of from 15 to 18 inches in diameter will produce at each tapping 6 pounds of rubber.

"The milk of the rubber tree contains 56 per cent of water and 44 per cent of rubber. The method of tapping the tree is an important matter, for upon this depends the success of the plantation. We will say nothing about the barbarous practice of cutting down the trees. Generally speaking, there are two ways of extracting the juice. It may be done by making a spiral cut in the bark of the tree to a height of about 30 feet, being very careful not to cut the tree itself, for in that case it will be likely to die. Another method—and it seems to us the most rational one—is to make an incision nearly around and at the foot of the tree; the milk will descend by its own gravity without the bark being injured by much cutting. When the juice has ceased to run, cover the cut very carefully with clay.

"The cost of planting rubber varies materially with the methods pursued in setting out the trees. If we accept as correct 25 feet as the distance at which trees should be planted from each other, and this method is to be preferred, 144 trees may be set out to each 2½ acres, approximately. For planting 10,000 trees about 200 acres will be

required. One man is said to be able to extract the milk from 20 to 25 trees daily. The month of May is preferred for this operation."

Dr. W. S. Cockrell, who for twelve years has been interested in agriculture in tropical Mexico, is authority for the following information on matters not fully covered by the preceding abstract:

"The conditions pertaining to and methods of planting india rubber—*Castilloa elastica*, the commercial rubber plant of Mexico—are very important features which have received hitherto inadequate attention. It is by no means a complex subject; on the contrary, by observing a few primitive and essential features, this most important industry may be conducted to a most successful and profitable result.

"*Locality.*—As a general rule, with a very few notable exceptions, rubber should be planted south of latitude 20° N. and below an altitude of 1,000 feet above sea level, where the annual rainfall exceeds 100 inches and where a large amount of humidity is precipitated as dew during the dry season.

"The exceptions are in protected valleys or locations within abovementioned latitude at elevations of several thousand feet where the surrounding mountains ward off the cold winds and preserve equable climate. Such locations do exist, but are rare and limited in area.

"*Soil.*—This is an all-important factor, and in a great measure controls results in direct ratio to its adaptability, fertility, and depth. Rubber will produce a luxuriant tree in almost any soil where the conditions of locality are favorable, but such a tree does not necessarily imply a profitable producer.

"By adaptability is meant a rich, alluvial, virgin soil, which is always of the requisite fertility. Its value as a rubber soil depends largely upon its depth or the subsoil, which factor gains its essentiality from the fact that the rubber tree is primarily a taproot feeder. The taproot is the perpendicular and principal root which penetrates the ground in relative proportion to the height of the tree. From the collateral or superficial roots sufficient strength may be drawn to maintain a luxuriant tree, but a well-nourished taproot is necessary to yield a bountiful supply of rubber milk, from which commercial rubber is extracted.

"Recently, by good fortune, a landslide was observed which demonstrated a rubber tree about 7 inches in diameter 3 feet from the surface of the ground with a taproot slightly more than 1½ inches in diameter 18 feet below the surface. It would have been interesting to know how much deeper this root extended, but circumstances were such that it was not feasible to ascertain. This demonstration was only confirmatory of much previous investigation extending over a number of years, all proving beyond a doubt that it is the taproot that furnished the excess supply of rubber which may be annually

extracted without detriment to the tree. Many trees not producing a remunerative quantity have been found invariably to be without a taproot, and no tree with a normal taproot has been found that did not produce an abundant and profitable supply. To enumerate a great number of instances, amply conclusive, would occupy more space than allowable and only confirm above deductions.

"*Method of planting.*—No less important than either of the foregoing factors is the method of planting. In order to secure a full complement of root supply, rubber seeds should be planted, at proper distance, in ground previously staked to indicate where the trees are to grow. From three to five seeds should be planted at each stake, so that if the rains wash any of the seeds out, or if at some stakes all fail to sprout, they may be easily and safely supplied from those where all, or the majority, have sprouted by removing the small plants 2 or 3 inches high, with proper implements, to supply the deficiencies. This may be done without jeopardy to the plants, and after all deficiencies have been supplied all but one plant should be removed from each place. In this way a very complete stand can nearly always be gotten the first year, and the deficiencies that may occur can be supplied by a repetition of seed planting the second year or by transplanting very small plants with roots intact. Transplanting from nursery plants of such a size as would necessitate injury to the taproot is to be carefully avoided, likewise planting from slips or cuttings, either of which may produce a thrifty looking tree of small productive capacity.

"There is ample reason for limiting the distance of planting to a maximum of 8 feet from tree to tree, and closer planting has been demonstrated to be successful. The object of close planting is to maintain continuous shade on the trunks of the trees, which is necessary to grow a soft bark, through which the milk will easily percolate, and this area will yield ample support to the tree in that the depth of the taproot is the real source of supply.

"A high state of cultivation, which in tropical countries implies keeping the ground absolutely clean and free from weeds and grass, is necessary, as there is no plant more sensitive or that more manifestly resents an intrusion than rubber."

The "India Rubber World", February 1, 1903, is authority for the following information in regard to the progress made in rubber planting in Mexico by 26 companies:

The total number of trees planted by the 26 companies, by years, is as follows:

1897	5,200	1901	1,101,678
1898	21,700	1902	2,991,000
1899	370,785		
1900	952,742	Total	5,443,105

Total acreage, 11,117.

The average number of trees planted per acre in 1902 by 13 companies was 400, 500, 496, 1,000, 200, 820, 800, 250, 800, 587, 2,000, 600, 611, respectively.

These 13 companies report a total planting of 2,671,000 trees in 1902 on 4,113 acres, or an average of 650 trees per acre. The practice is general of close planting, both to allow for failures and with the idea of extracting some rubber from the surplus trees when they have grown so as to make their removal necessary. While some of the companies have tried various methods of planting as regards shade, generally one plan has been adhered to in each case, and further planting, as a rule, will be done under the same method as in the past. The distribution of the total planting to January, 1903, was as follows:

How planted.	Number of trees.
In the open	3,202,920
In the open and semishade	1,117,000
In semishade	1,019,185
In the shade	4,000
Not stated	100,000
Total	5,443,105

Ten companies planted in the open, 2 in the open and semishade, 11 in semishade, 1 in shade altogether, and 2 did not report.

Nine companies planted from nurseries and at stake, 12 from nurseries principally, and 3 at stake alone.

In regard to transplanting from nurseries and planting seeds at stake, while the practice of the different companies varies, in most cases the plan adopted in the past will be continued. The total planting has been distributed as follows:

How distributed.	Number of trees.
From nursery and at stake	2,075,400
From nursery alone	1,895,705
At stake alone	372,000
Not stated	100,000
Total	4,443,105

To give an idea of the extent of the preparation made for future planting, it may be mentioned that 19 of the 26 companies reported having in nurseries at the end of the season a total of 11,462,000 young plants, in numbers ranging from 7,000 to 2,000,000 each. Two companies reported no nurseries, having completed planting, and 5 made no report.

The report of Consul-General Barlow, bofore mentioned, gives at 45 the number of American firms engaged in rubber planting in México as follows: Chiapas, 12; Oaxaca, 10; Puebla, 1; Tabasco; 2; Veracruz, 19, and Tepic, 1.

Mexican official figures give the following total production of rubber for the last five years:

Year.	Kilos.	Value.
1898	120,916	$227,371
1899	606,129	272,821
1900	197,560	245,316
1901	187,052	344,145
1902	118,293	279,675
Total	1,229,950	1,369,328

For 1901–2, Chiapas is credited with the largest production, viz, 94,643 kilos, at $257,160, and Tabasco with 17,050 kilos, at $15,451. The other States mentioned are Oaxaca, Puebla, San Luis Potosí, and the Territory of Tepic. Exports of rubber for the year 1902 are officially given by a Mexican authority[a] at 178,668 kilos, valued at $331,096, the United States being credited with 136,923 kilos, at $254,565; France with 23,764 kilos, at $41,715; Germany, 17,474, at $34,296; and Colombia and Holland with 400 and 107 kilos, respectively.

Chicle.—One of the principal productions of México is the gum known as *chicle*, which exudes from the *chico-zapote* tree, found growing wild along the Coatzacoalcos, Corte, Coachapa, and Uspanapa rivers. The product of this tree is usually gathered by the Indians in the forests along these rivers, and no important attempt has been made toward growing the tree as an industry, although the gum forms a very large proportion of the exports of the country. The cultivation is inexpensive, being not greater than 1½ cents per tree annually, and it would seem that where one chewing-gum factory in the United States had an output in the year 1896 of 1,000,000,000 pieces of chewing gum, all made from the Mexican *chicle*, the industry would be a remunerative one. The trees should be planted not more than 400 to the acre, at a cost of 5½ cents each. They mature after reaching the age of 8 or 10 years, when they are from 12 to 15 inches in diameter and in a condition to tap. Each tree yields from 5 to 6 pounds of the merchantable gum, at a cost of 8 to 10 cents per pound to extract it, and sells for an average of 50 cents per pound at Minatitlán and Coatzacoalcos, on the Isthmus of Tehuantepec.

In 1898–99 the United States imported from México *chicle* gum to the amount of 2,445,061 pounds, valued at $363,051 gold, and in 1903 the importation of this gum amounted to $954,389 gold, chiefly from México.

The total production of the various gums and resins, except rubber, for the year 1901–2 was as follows, according to the "Anuario Esta-

[a] Importación y Exportación de la República Mexicana en 1902. Secretaría de ento, Colonización é Industria. México, 1903.

dístico:" Chicle gum, 439,753 kilos, valued at $429,570; "mesquite" gum, 29,687 kilos, at $4,458, and "copal" resin, 54,912 kilos, at $30,752. The production of these gums for the last five years is given by the same authority, as follows:

Year.	Chicle.		Mesquite.		Copal.	
	Kilos.	*Value.*	*Kilos.*	*Value.*	*Kilos.*	*Value.*
1898	1,005,648	$685,397	15,765	$6,014	9,079	$2,185
1899	600,675	502,471	250,752	9,523	247,868	9,062
1900	2,132,247	1,432,659	25,316	9,443	125,167	27,196
1901	1,897,076	1,106,554	37,236	6,355	15,172	4,429
1902	439,753	429,570	29,687	4,458	54,912	30,752
Total	6,075,399	4,156,651	358,756	35,793	452,198	73,624

Exports of chicle during 1902 are officially quoted at 1,759,578 kilos, valued at $1,270,466, the United States being the only buyer, while "other gums and resins" are given at 29,208 kilos, valued at $9,519, exported to the United States and Germany, the former being credited with 27,073 kilos, worth $9,219.

Vanilla.—As far back as the time of the Aztecs the vanilla bean was used to spice the chocolate. The Spaniards, quick to see the value of vanilla as an article of export, began the cultivation of the aromatic pod. For a long time the former province of Veracruz supplied the whole world with vanilla until the Bourbon Islands and Java waged competition against it.

France is the leading market for this product; Germany, England, and the United States follow in the order named. México furnishes over two-thirds of the vanilla beans imported by the United States—140,000 pounds a year, worth $640,000.

The vanilla of México is the superior of all other varieties as to aroma, and the pod yields a much larger quantity of essential oils. In the markets of the United States it commands two or three times as high a price as that of other countries.

Usually the plant begins to yield thirty-nine months after planting. It thrives best in the damp, not muddy or swampy, lands of the Torrid Zone, shade being a necessity; and yields its product during ten to twelve years. The average yield is from 10 to 20 pods to the vine, artificial fertilization of the flower producing much more. The cultivation of vanilla has many advantages, among others that corn and similar products may be cultivated in conjunction with it, and on coffee plantations as a secondary product.

In México the pods are sold by the thousand. The cost for clearing and planting an acre of ground is estimated at $39, and the cultivation, including the artificial pollenizing of the flower, amounts to about $9 a year for each acre. The expense of gathering, curing, and preparing the pods for market is about $26.50 per thousand. Of recent years green vanilla has been selling at Papautla, a canton of

the State of Veracruz, where the best quality grows, at prices ranging from $80 upward a thousand pods. In 1896 it sold for $146 a thousand.

Vanilla grows in the States of Veracruz, Oaxaca, Chiapas, Tabasco, Michoacán, and Jalisco, also on the Isthmus of Tehuantepec, where there are two species growing in a wild state.

According to Mexican official statistics, the production of the vanilla bean for the last five years is estimated at the following figures:

	Kilos.	Value.
1898	41,794	$1,628,630
1899	18,941	868,957
1900	14,863	472,666
1901	127,681	1,872,462
1902	6,219	22,289
Total	209,498	4,865,014

Exports of vanilla for 1902 are officially estimated by Mexican authorities at 51,492 kilos, valued at $1,145,904, of which amount the United States took 47,642 kilos, with a valuation of $1,027,774, the other exporters being France, Canada, and Italy, in the order given. Consul-General Barlow reports that there are 12 American firms in the State of Veracruz engaged in the cultivation of the bean.

Sugar cane.—The cultivation of sugar cane was among the agricultural improvements introduced into México by the Spaniards. It appears that Cortés had two plantations in Izcalpam, and these were followed by others until in 1553 sugar was exported from México to Spain and Perú. The cultivation of the cane was then limited to the "Intendencias" of Guanajuato, Guadalajara, Puebla, México, and Veracruz. Toward the end of the eighteenth century the industry received a great impetus on account of the poor crops of Santo Domingo and other cane-producing countries. The increase in the development of the industry, however, was not so great as had been anticipated. All the coasts of the Republic, the entire *tierra caliente* or hot lands, and a great part of the temperate region are adapted to the cultivation of sugar cane.

The cane, especially on the Gulf slope, grows to an enormous size, and does not need regrowing for ten years at least. No plowing or irrigating is needed. Clearing, planting, and cultivation does not cost $45 per acre, and the cane is ready to cut in ten months after planting. The plant produces from 30 to 35 tons of cane per acre, yielding 20 to 25 tons of juice, containing from 15 to 16 per cent of crystallizable sugar, and a plantation well cared for will yield for thirty years. The process most in vogue only extracts about 6 per cent of this sugar; it is asserted that by the use of improved machinery an

acre could be made to yield 3 tons of refined sugar. At Suchilapam and adjacent places four canes have yielded a gallon of juice.

It is claimed[a] that in the States of Morelos, Puebla, Michoacán, Jalisco, and Colima the yield of cane to the acre may be reasonably counted upon at 45 tons, while in Veracruz, Oaxaca, and Chiapas as much as 60 tons are obtained, the general average in the northern part of Veracruz, Tamaulipas, and Nuevo Leon being 40 tons. The same authoritiy quotes an estimate, which is claimed to be very conservative, of the results that can be obtained in a 500-acre plantation, the net product of which is estimated at $188,425 per annum, while the approximate cost of machinery, buildings, etc., for a sugar factory to take off the crop in one hundred days is given at from $100,000 to $300,000 Mexican currency.

In regard to the sugar production of México, the following extracts are taken from an interesting paper on the subject by Mr. Alfred F. Gray:[b]

"México is in many respects an ideal sugar-producing country. In many parts of the Republic the climate and soil are favorable to the growth of the sugar cane, and not only is the cane itself very rich in saccharine matter, but replanting every year is not necessary, as it is in Louisiana; for example, as many as eight or ten crops being gathered in México before new seed need be planted. There is no reason, so far as natural conditions are concerned, why México in certain parts should not rank with Cuba as a sugar producer, and that she is not yet an important factor in the world's market as a producer rather than a consumer is due to the fact that production has barely caught up with home consumption.

"Though the Mexican sugar plantations best known to the outside world are in the lowlands along the Gulf coast, notably in Veracruz, sugar is successfully raised in many States of the Republic, including Tabasco, Jalisco, Morelos, Puebla, Sinaloa, Guerrero, Yucatán, Michoacán, Oaxaca, San Luis Potosí, Colima, and others. These plantations are owned and have been owned for generations by old Mexican families who possess immense tracts of land and have had an abundance of cheap peon labor. Their mills were primitive, though the cost of installing them in the inaccessible portions of the interior and undeveloped States was prohibitive for all except men of wealth, as wealth was reckoned in México some years ago, and this same lack of transportation facilities added much to the cost of the product anywhere outside of the local market of each plantation. As a consequence the country's production of sugar has heretofore been far short of the demand.

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[a] The Hacendado Mexicano's sugar report, 1899–1900, p. 3. Mexico City.

[b] "The Banker and Miner of Mexico." July 1, 1903.

"These conditions, and the further fact that the Government, in pursuance of its general plan of protecting home industries, placed an import tax on sugar of 15 cents (Mexican) per kilo, or 2.67 cents per pound in our currency, made the sugar industry a very profitable one, and in the recent awakening of the country to new life and activity much new capital has been invested in sugar plantations.

"A large part of this investment has been made by local capital. But there are many Americans who have made investments in Mexican sugar plantations individually and in plantation companies.[a] Several Louisiana planters, having got under cultivation practically all the available home territory, have extended their operations into the cheaper Mexican country, and a number of companies for the exploitation of sugar plantations have been formed in Ohio, Indiana, and other western States in the past few years and are now beginning to produce.

"It appears, however, that there has not yet been established in México what is considered in New York to be a regular sugar refinery. There are many mills and small factories, the primitive concerns of the old plantations in the more remote districts, and there have lately been built a number of modern factories that have cost from $300,000 to $500,000 in United States currency, which produce raw or partially refined sugar from the cane. But a refinery, as we use the word, means a plant to manufacture the many grades of refined sugar out of raw cane.

"The increased production due to the new enterprises in this line is having its effect on the Mexican sugar market. Their output has very materially increased the total production of the country. In the season of 1899–1900 this amounted to 78,000 tons of 2,240 pounds each; in 1900–1901 it was 95,000 tons; in 1901–2 it was 103,110 tons, and the last crop, 1902–3, is estimated at 115,000 tons. Naturally the price has fallen in consequence of this increased supply, as the consumption has not correspondingly increased. In México the price asked for first sugars in carload lots last January was $2.75 to $3 Mexican currency, per arroba of 25 pounds, which is equivalent to 4.28 cents to 4.70 cents per pound in United States currency, and in May the price had fallen to the equivalent of 3.61 cents United States currency, per pound.

"This decline in the Mexican market is the more remarkable because at the same time the prices of sugar in the markets of the world were steady, with advances in some parts. In other words, the production of sugar in México is approaching the point where it will satisfy the

[a] Consul-General Barlow reports 21 American firms engaged in sugar planting and manufacture, as follows: Chiapas, 1; Yucatán, 1; Lower California, 2; Oaxaca, 2; Tabasco, 2; and Veracruz, 13.

needs of the country, while the rest of the world is in need of new sources of supply. The dividing wall between the two markets is the protective import duty México has set upon imported sugar. But México is beginning to climb over that wall, as is evidenced by the recent shipment of 25,000 bags of sugar from Veracruz to Liverpool and New York.

"México must now be classed among the countries which export sugar, and the quantity which she will ship to foreign countries will doubtless steadily increase. The assessment of 2.67 cents (United States currency) per pound duty on any sugar which might be imported is a great protection to the sugar producers and enables them to maintain a price for sugar sold for local consumption sufficiently high to offset any small loss which might result from the export of part of their crops to foreign countries. For instance, in case their local price should decline to 3 cents per pound, they could well afford to sell 66 pounds of their production at this figure, and accept as low as 1½ cents per pound on 34 pounds shipped out of the country, thus making an average of 2.49 cents per pound net at the factory, which would show a good profit on sugar which cost 1½ to 2 cents per pound to produce.

"As labor in México is abundant and cheap, and much land suitable for the cultivation of sugar cane is still available, the sugar industry of the country may be expected to extend to large proportions, and the country offers a desirable field for the conservative investor who possesses abundant capital and the necessary technical knowledge of sugar production."

The total production of sugar cane during the year 1901–2, according to the "Anuario Estadístico," amounted to 2,745,686,000 kilos, valued at $22,872,033, the following being the States producing over 20,000,000 kilos:

State.	Kilos.	Value.
Hidalgo	20,716,931	$213,896
San Luis Potosí	23,585,868	269,409
Yucatán	28,625,360	345,120
Chiapas	41,696,422	1,272,699
Oaxaca	73,303,803	830,202
Nuevo León	105,575,770	599,130
Jalisco	166,294,750	3,360,895
Sinaloa	176,175,400	499,828
Michoacán	238,340,187	2,424,276
Tepic	372,835,200	350,880
Puebla	558,323,900	6,102,472

The production of sugar and molasses for the same period, according to the same authority, is shown in the following table:

State.	White sugar.		Brown sugar (Panocha).		Molasses.	
	Kilos.	*Value.*	*Kilos.*	*Value.*	*Kilos.*	*Value.*
California			1,640,140	$180,090	1,000	$150
Campeche	494,810	$79,889	36,000	10,583	1,853,850	113,219
Coahuila	30,000	6,000	690,416	95,976	30,280	3,039
Colima	1,802,750	290,940	235,450	29,164	88,400	20,916
Chiapas	553,049	133,716	3,856,608	370,108	1,925,551	109,080
Durango			736,526	93,359		
Guanajuato			95,000	9,000		
Guerrero	1,105,201	226,868	1,659,874	137,941	590,159	26,561
Hidalgo	5,000	2,000	4,993,128	406,179	500,000	50,000
Jalisco	8,286,200	1,795,433	5,500,251	523,917	2,359,640	231,737
México	198,145	40,911	450,389	53,109	313,700	23,930
Michoacán	8,963,445	1,907,357	8,748,090	1,025,502	3,607,532	168,156
Morelos	41,546,035	8,034,153	517,500	56,596	22,327,279	944,743
Nuevo León	13,900	2,780	8,431,625	900,942	113,750	35,407
Oaxaca	1,868,079	326,873	2,888,948	310,366	6,408,068	670,425
Puebla	6,983,771	1,478,864	11,875,425	1,543,557	3,596,600	122,192
Querétaro			72,000	7,020	200,000	2,000
San Luis Potosí	123,000	31,980	4,006,996	264,168	420	42
Sinaloa	5,150,000	1,175,000	2,506,025	365,326	236,200	35,576
Sonora			139,089	30,473	600	300
Tabasco	809,198	131,839	793,940	62,005	984,833	32,564
Tamaulipas	10,000	2,000	931,173	73,512		
Tepic	1,556,900	371,518	686,420	66,803	209,290	8,365
Yucatán	3,318,404	1,065,639	3,528,700	280,296	1,841,348	136,260
Zacatecas			3,027,200	243,536	22,130	1,328
Total	82,307,887	17,103,760	68,046,713	7,141,528	47,210,630	2,735,940

Rum from sugar cane is given for the same period at 358,185 hectoliters, estimated at $1,028,616, the total production for the last five years being, in round numbers, 3,000,000 hectoliters, at $50,000,000.

Heniquén.—Chief among the numberless fiber plants produced by México is the *heniquén* (*Agave rigida*), also called sisal grass or hemp, the natural home of which is the Peninsula of Yucatán. It belongs to the *Maguey* (*Agave*) family, and was called *metl* by the Aztecs, who from time immemorial used it as an article of food, the leaves being utilized for roofing, the fiber for weaving, and the juice for the preparation of a drink called *octli*, the *pulque* of to-day.

There are several species of the plant, known by Maya names, and which require little or no cultivation and but small outlay.

The production of this fiber in 1901–2 is officially given as 54,597,500 kilos, valued at $16,937,809, and for the last five years at the following figures:

Year.	Kilos.	Value.
1898	67,312,462	$15,351,233
1899	118,872,440	33,227,203
1900	87,613,966	18,262,786
1901	81,677,698	22,041,825
1902	54,597,500	16,937,809
Total	410,074,066	105,820,856

The condition of the heniquén industry in Yucatán in 1901–2 is given as follows by United States Consul E. H. Thompson at Progreso, in a report made to the Department of State of the United States:

SAN GABRIEL ESTATE SUGAR FACTORY, MORELOS.

The output of the Yucatán fiber for the ten years ended December 31, 1901, was:

[Each bale weighs approximately 400 pounds. A bale of hemp at present prices is worth $84 Mexican. The Mexican dollar is worth about 40½ cents gold.]

Year.	Bales.	Year.	Bales.
	Number.		*Number.*
1892	353,525	1898	418,972
1893	355,123	1899	445,978
1894	373,883	1900	499,634
1895	381,504	1901	517,519
1896	397,163		
1897	419,975	Total	4,163,276

The output for the fiscal year ended June 30, 1902, was:

Month.	Bales.	Weight.	Value.	
			Mexican currency.	United States currency.
1901.	*Number.*	*Tons.*		
July	64,460	10,319.7	$1,960,737	$841,156
August	48,726	7,988.6	1,917,277	822,512
September	44,634	7,271.9	2,327,017	998,290
October	32,455	5,295.7	1,725,912	720,416
November	40,328	6,342.3	2,377,077	1,019,766
December	34,747	5,515.1	2,128,960	912,466
1902.				
January	45,998	7,355.1	2,726,792	1,169,794
February	38,052	5,889.2	2,334,179	1,001,363
March	60,915	9,712.7	3,496,591	1,500,033
April	61,887	9,769.8	4,469,589	1,917,497
May	50,547	7,956.7	3,433,308	1,472,909
June	41,559	6,588.4	2,662,844	1,142,246
Total	564,308	90,005.3	31,557,888	13,538,343

The "Boletín de Estadística Fiscal" for 1901–2 estimates the total exports of raw henequén at 91,944,355 kilos, with a valuation of $29,209,515, while during the first six months of 1902–3 the same publication for such period gives the following figures: 37,510,884 kilos, at $15,030,217.

Ixtle.—The *ixtle*, or *maguey manso* (*Agave ixtle*), is another important fiber, imported into the United States as Tampico fiber, for the manufacture of paper, and other industries. The quantity of ixtle produced by México in 1901–2 is estimated at 12,483,662 kilos, with a valuation of $1,706,892. Coahuila is the largest producer, followed by San Luis Potosí and Oaxaca. The production of this fiber has been on the increase for the last five years, as shown by the following table:

Year.	Kilos.	Value.
1898	8,263,359	$698,189
1899	8,354,353	808,621
1900	8,474,194	961,769
1901	9,639,867	1,082,617
1902	12,483,662	1,706,892
Total	47,215,435	5,258,088

The exports of raw ixtle during 1901–2 are thus estimated by the "Boletín de Estadística" for the same period, 12,475,361 kilos, at $1,745,077, and for the first half of 1902–3 at the following figures, 8,645,059 kilos, at $1,465,950.

Other fibers.—There are many other fiber plants in the country, such as cotton, already mentioned; the angú (*Hibiscus esculentus*), which also serves as food; hemp (*Canabis indica*), both textile and medicinal; the ceibón or cotton-silk tree (*Bombax pentandria*); the hunari (*Sida romboidea*), also medicinal; several plants of the Agave family; the pita or wild pineapple (*Furcrea gigantea*); the pitahaya (*Cereus variabilis*); the ramie (*Boehmeria hivea*), of which there are two varieties; and several others, such as the plantain (*Musa textilis*), the cocoanut tree (*Cocus nucifera*), and the Lechuguilla (*Agave heterocanta*).

Maguey and its products.—The "maguey," from which the national drink, pulque, is extracted, is indigenous to México, but it is found growing in the United States, although not in any great abundance. There are 125 species of this plant peculiar to México. The "maguey" grows most abundantly on the great plains, the plateaus, at an elevation of more than 7,000 feet above the sea. On the vast plains of Apam, about 100 miles from the capital, the plants are to be seen as far as the eye can reach, laid out in straight rows having an interval of 3 yards between them. It is said that there are 33 species of the plant on the plateaus. As far back as 1519 the native Mexicans cultivated the "maguey," of which great variety of products were obtained from the roots, leaves, and juice. Paper was made from the pulp of the leaves, twine and thread from their fibers, and needles from the sharp tips of their leaves. These leaves also serve as thatching for the houses of the poor. The rare and valuable Mexican manuscripts in ancient times were made of pulp from the "maguey," which resembles the papyrus. It is claimed that at least 40 different articles are manufactured from the plant. Some of the "maguey" plantations produce a revenue of $10,000 to $12,000 per annum.

Pulque is the fermented juice of this plant, and the consumption of this beverage in the City of México and outlying towns in the Federal District is something enormous. In the city alone in 1901–2 there were over 1,000 shops devoted exclusively to its sale. A train on the Mexican Railway leaves the plains of Apam every day laden with nothing but pulque in barrels and skins, deriving a large revenue from the shipments.

The production of pulque during the fiscal year 1901–2 is estimated at 3,168,602 hectoliters, valued at $4,009,219, the principal producer being Tlaxcala, with an output of 2,070,502 hectoliters, valued at $2,110,216, and next Hidalgo, with 776,835 hectoliters, at $1,096,586, and México, with about 207,500 hectoliters, valued at about $440,000.

Mezcal or *tequila* is a strong alcoholic beverage, colorless or of a very light amber tint. It is distilled from the root of the "maguey mezcal" or "tequila" (*Agave americana* Lam.), and has an odor and taste not unlike Scotch whisky. Mexicans claim that it has good stomachic qualities, but it is a great intoxicant. The best quality of the article comes from the district of Tequila, in the State of Jalisco, from which it derives its name. The total output for 1901–2 is officially estimated at 188,732 hectoliters, at $3,714,498, the production of the State of Jalisco alone being credited with $1,171,670 for the finer grade (tequila), and $61,290 for mezcal or the coarser variety. The total product of the country for the last five years was 1,199,047 hectoliters, valued at $25,217,406.

Tlachique is the unfermented juice of the maguey plant, and is also consumed in large quantities, the output in 1901–2 being 1,180,192 hectoliters, valued at $2,258,450, the State of México being credited with over 610,000 hectoliters, at $1,063,000.

Zacatón.—Among the numerous plants that México produces that are being utilized in the industries of various countries is "zacatón," or broom root. It belongs to the family of Graminaes (*Epicampes macroura*), and is found in a wild state in many sections of the country. Having been classed as a weed, it has never been cultivated to any extent. The valuable part of this plant is the root. This may be gathered at all seasons of the year. A peon digs it up with a tool resembling a hoe, and it is subjected to a cleaning operation by which the root is deprived of its thin skin and all objectionable matter. The root is then exposed to the fumes of sulphur, for the purpose of bleaching it to the pale, yellowish color preferred by the trade; it is then sorted by quality, the preferred parts being the thin and straight, or only slightly curly ones. Zacatón is packed in bales for shipment, the material being compressed by a primitive contrivance. Experiments have proven the beneficial effects of cultivation, the root produced being superior to that of the wild species.

France and Germany are the principal markets for zacatón, fully 90 per cent of the entire yearly shipments from Veracruz going to those countries, the remaining 10 per cent being shipped to the United States, Belgium, Spain, England, Holland, etc.

The following prices, per 50 kilograms (110 pounds), are quoted for zacatón at Hamburg:

	Marks.
Low grade	30 to 34=$7.14 to $8.09
Ordinary	39 to 42= 9.28 to 9.99
Middling	43 to 46=10.23 to 10.94
Fine	50 to 58=11.90 to 13.80
Extra superior	63 to 75=14.99 to 17.85

The average value at Hamburg is $11 to $43 in United States currency per 50 kilos. The shipments of zacatón through the port of

Veracruz amount to 2,500 metric tons yearly, valued at $800,000 at the point of embarkation.

Official statistics for 1902 give the total exports of zacatón during that year at 3,833,027 kilos, valued at $1,468,635. Germany is represented in this export, in round numbers, with 1,670,000 kilos at $730,000; France with 1,308,000 kilos at $482,000, and the United States 778,000 kilos at $226,000.

Oleaginous plants.—México produces several plants yielding oils, both industrial and esculent; but up to the present no great industry has been founded in the country based upon the presence of many varities of trees and plants giving oil-bearing products and the adaptability of much of the soil to the cultivation of these and other species.

Among this kind of plants may be mentioned the *piñón* (*Jatropha curcas*), which yields 16 per cent of an emeto-cathartic oil of great strength.

The *Palma christi*, or castor bean (*Riccinus communis*), yields 40 per cent of a medicinal oil. As this contains a large proportion of stearin it can be used in the manufacture of candles. This plant grows spontaneously and in great profusion in the hot and low temperate lands. One acre will produce about 1,600 pounds of oil. The *ajonjolí* (*Sesamun indicum*), or sesame, gives 33 per cent of a very soft, sweet, and agreeable oil.

The nut of the *hicaco* (*Chrysobalanus icaco*) also produces the same percentage of an esculent oil having the same properties as the almond oil.

The peanut (*Arachis hypogæa*) gives the same amount. This and the last above-named oil are much prized in Marseille.

Among the oleaginous plants may be mentioned the following: Cacao (*Theobroma cacao*), cocoanut (*Cocos nucifera* and *Alfonsia elacis oleifera*), the *chicalote* (*Argemone mexicana* and *A. grandiflora*), the *chia* (*Salvia polystachia*), the linseed, and others.

The "Anuario Estadístico" for 1901–2 estimates as follows the production of several oleaginous plants: Sesamun, 17,839 hectoliters, $92,593; peanut, 101,851 hectoliters, $355,739; castor bean, 38,330, $164,649; linseed 53,560 hectoliters, at $268,500.

Viticulture.—The experiment of introducing the vine, olive trees, and the silkworm industry into México dates back as far as the conquest. Cortés himself had plantations of mulberry trees at Yautepec and Tetecla. The silkworm industry made fair progress at first, but the competition of Manila and Spain caused its gradual neglect. In 1790 an effort was made to revive it, but without success.

"The cultivation of olives and the vine," says Bancroft,[a] "labored under severe restrictions. Admirably adapted as soil and climate were for both purposes, the few plantations of olives were merely

[a] History of Mexico, Vol. III, p. 613.

allowed to exist because they belonged to pious or charitable establishments, while as to the vine, the viceroys were repeatedly instructed not to permit the planting of new cuttings, nor even the replacing of vines in decay (1595). Wine could only be made on condition of paying taxes to the Crown, and it was not until 1796 that a more liberal policy in this respect was adopted."

At the beginning of this chapter reference was made to the efforts of the Department of Promotion to encourage the culture of these plants. According to a report made by Señor Don Francisco Mallén to the Department of Promotion on the encouragement given to the propagation of vines and fruit trees in the country, México, in 1892, imported 1,053,450 plants, as follows: Vine cuttings, simple, 1,030,000; with roots, 11,000; olive cuttings, 9,250, and fruit trees of different varieties, 3,200. More than half a million of these vine cuttings and 4,000 olive shoots were planted in Parras and 62,500 cuttings in Viezca, both in the State of Coahuila; 50,000 in Ciudad Juarez, Chihuahua, and the rest were distributed in the Central Plateau and other regions in the southern part of the Republic. The first trial plantations were very succeesful, and the culture of the fine imported qualities has become more general, the planters having requested renewals of their original orders. The grape thrives best in Parras, which has become the center of viticulture in the country. California vines have given better satisfaction in this section than those from Europe. At the time of the above-mentioned report (1892) the Rosario plantation or vineyard (the largest in the Republic) had made a request for 25,000 additional cuttings, being already supplied with 60,000 vine stocks of the European and about 13,000 of the California species, some of the former having been grown from those distributed by the Department of Promotion, while others had been imported directly from Spain, Italy, and France. It has been demonstrated that the California species thrives better.

According to the "Anuario Estadístico" for 1901–2 the grape production of the country during that year amounted to 2,617,871 kilos, at $190,966. Coahuila's production is given at 1,444,730 kilos, valued at $64,496. Lower California, in round numbers, produced 309,000 kilos, at $38,000; Durango 235,000 kilos, $31,000; Agua Calientes 234,000 kilos, at $6,200. Grape rum and grape wine are estimated by the same authority, for the same period, at 1,913 hectoliters of rum at $77,100 and 8,114 hectoliters of wine at $226,470. Coahuila's production of rum was 1,883 hectoliters at $75,320, and 7,183 hectoliters of wine at $192,600.

It can not be said that México has yet developed as a wine producing country, but serious efforts in this direction have been made since 1883. The wines now made, as a rule, are too light and acidulous. Table grapes are raised in considerable quantity, however, and their quality is becoming a dangerous rival to the California varieties for local consumption.

The land best adapted to viticulture is in the vicinity of the city of Parras, State of Coahuila. Since 1890 the industry of the manufacture of wines has been making great strides. Several varieties of vines have been imported from abroad, and at the two largest wineries cellars have been constructed and all the latest improvements for vinous fermentation introduced, being under the management and direction of foreign experts in the art. In 1897 there were about 4,000 acres planted in vines in the locality named, most of the grapes being of the variety known in California as the "Mission" grape, it having been introduced there by the missionary fathers from Spain. In the year noted wine sold on the ground at $1.20 per gallon Mexican money.

Olive and mulberry trees.—As regards olive and mulberry trees, the only official data available show that in 1893 there were imported 72,000 olive cuttings, of which 4,000 were planted in Parras. It is anticipated that the encouragement given this industry by the Department of Promotion will greatly advance its progress. When the late Gen. Cárlos Pacheco was Secretary of Promotion he gave new life to the cultivation of the vine and the mulberry tree. The latter, which is so necessary to the silkworm industry, is now receiving attention in many places, principally in the States of Puebla, Jalisco, Michoacán, and Guanajuato. A Mexican planted, in 1896, 152,000 mulberry trees in the State of Guanajuato, pursuant to a contract made with the State legislature, in which contract he binds himself to lay out 2,000,000 trees within two years.

FRUITS.

México possesses exceptional conditions for the production and trade in fruit owing to her situation and the fertility of her soil. The United States, her principal market, lies at her very doors, and communication by water and land is both rapid and moderate in charges. The most favored Mexican fruits in the United States are the orange, lemon, lime, pineapple, and banana. But the day will come when other tropical fruits will be appreciated and become a large element of the American imports. Fruits such as the mango (*Mangifera indica*), custard apple (*Anacardium occidentalis*), chirimoya (*Anona cherimolia*), mamey (*Mammea americana*), zapote (*Achras zapote*), the alligator pear (*Persea gratissima*), and others which are distinctively tropical, when properly appreciated, will be consumed largely in American markets.

Bananas.—The banana grows spontaneously in great abundance near the Mexican coast. On lands near the sea, at an elevation of from 1,900 to 2,400 feet above it, great plantations of banana trees can be laid out at a cost of 5 cents per plant, which includes every expense up to the time of bearing fruit. At the end of the first year

the plant produces one bunch, which can be sold in the United States at from $2.50 to $3. A thousand banana trees, costing $50, will bring $1,000 at least in one year. An acre will produce from 700 to 800 bunches, at a cost not exceeding 8 cents a bunch, each of which can be sold on the ground for 40 cents, yielding a net profit of at least $225 per acre. The exportation of this fruit from the West Indies and Central America reaches into the millions every year.

The production of bananas in 1901–2 is officially given at 19,057,775 kilograms, estimated at $445,792. The largest production, over 3,500,000 kilos, is credited to Michoacán; next ranks Morelos, with over 2,700,000 kilos; Jalisco, 2,500,000, and Puebla, with 2,335,000 kilos. San Luis Potosí, Sinaloa, Tamaulipas, and Tepic are credited with over 1,000,000 kilos each. Tlaxcala and Aguascalientes are the only States not represented in the Mexican official statistics in reference.

Oranges—The orange is the leading member of the aurantiaceous family under the genus citrus. Three kinds grow in México—the sweet, the sour, and the Chinese or mandarin, and another called "lima-orange," which is a variety of the sweet orange. The country affords much better facilities for the cultivation of the aurantiaceous fruits than the southern part of Europe, which suffers the disadvantage of lack of rains in the summer, rendering it necessary to irrigate the trees for five months in the year, thereby incurring an increased expense. In México the rains begin in May or June, thus rendering irrigation wholly unnecessary.

The California and Florida stock have recently been imported into the country and grafted and budded with the Mexican trees. Many thousand acres of land are being opened up to this cultivation in the Northern States. Many are the uses to which this tree can be put, as witness the following quotation from a report of the United States consulate-general to México.[a]

"The orange leaves are the tea of the Indians and of the poor, and in large cities, where they are peddled in the streets and sold in the markets in small bunches for 1 cent apiece, are consumed in large quantities. They are considered the best remedy for insomnia and restlessness, and are also highly commended as a night drink for children. A fine wine is manufactured from the refuse oranges purchased at 20 to 30 cents a hundred, in Cuautla, Morelos, and Guadalajara, which retails at 50 cents a bottle.

"There are other valuable products which could be obtained, such as the distilled water of the blossoms, used for toilet purposes, worth $4.50 a gallon; citric acid from the pulp of the sour oranges, worth $1 a pound; a pomade, much used as a cosmetic, worth $2.50 a pound; oil

[a] United States Consular Reports, "Orange Cultivation in Mexico," Vol. LIII, pp. 209–222, 1897.

from the leaves and rind, which constitutes the main odorous ingredients of cologne waters and elixirs, worth $3.50 to $5 a pound, and the essential oils from the blossoms, leaves, and unripe fruit, known as *Neroli pétale*, *Neroli bigarade*, and *essence de petit grain*, high odors used by the perfumers, generally worth from $5 to $6 an ounce. The second oil mentioned could be manufactured at a small expense, the flowers costing not more than 12½ cents a pound, out of the numerous wild groves of sour oranges existing in the greater part of the tropical belt of México."

The orange tree can be cultivated in México on lands at an altitude from 100 to 2,500 feet above sea level. Mexican growers usually propagate the orange from the seed, although it can be reproduced more advantageously by budding, grafting, layering, inarching, and from cuttings. In the latter case the fruit appears in from four to five years, and in the former in from seven to eight years. The flower in the warmer climates appears in the latter part of October, and the season lasts throughout the whole orange territory until May. During the months mentioned the blossoms can be collected by placing mats on the ground and gently shaking the trees. Not less than from 10 to 15 pounds of fresh flowers can be obtained from a full-grown tree, and some trees produce as high as from 25 to 30 pounds.[a] A good business can be done by properly drying the blossoms, which reduces their weight to half, and druggists and dealers pay from 75 cents to $1 per pound for these. The fresh blossom brings from 25 to 37½ cents per pound.

The yield of the orange trees in México varies considerably, soil, climate, proper irrigation, where needed, pruning, and cultivation being important factors in determining the extent of the crops. In Atlixco, Yautepec, and Tacámbaro the trees average 860 oranges each; but in Atotonilco, Montemorelos, and Hermosillo the average yield is from 1,700 to 2,200 oranges per year, producing one crop a year. With the advantages of climate and soil, the Mexican orange tree should yield from 5,000 to 8,000 oranges.

Good orange lands can be procured in Lower California, Chihuahua, Coahuila, Sinaloa, and Durango for from $5 to $25 Mexican currency per acre; in Sonora, Nuevo León, Puebla, and San Luis Potosí, from $25 to $50 per acre; in Michoacán, from $5 to $50 an acre; in Morelos, Jalisco, and Veracruz, from $100 to $250 an acre; in Guerrero, México, Tepic, Tamaulipas, Oaxaca, the Isthmus, and Chiapas, from $40 to $60 an acre. These prices are for small tracts running from 100 to 500 acres; larger tracts can be obtained much cheaper.

[a] Señor Romero (*op. cit.*, p. 59) says the production of flowers per tree is from 22 to 55 pounds in the case of sweet oranges, and from 60 to 100 pounds per tree from the bitter variety.

The United States yearly consumes about 70,000 carloads or 21,000,000 boxes of oranges; of these, 10,000,000 boxes were formerly furnished by Florida and about 3,000,000 by California. The shipment of oranges from México for the year 1896 was about 700 carloads, and during the season 1896–97 the exportation from the Republic was about 1,050 carloads. Notwithstanding the protective duty imposed by the United States up to January, 1899, the agent of the Department of Promotion of México in Kansas City disposed of 41,100 boxes of oranges, the gross proceeds of which were $121,898 gold. During the fiscal year 1897–98 the United States imported Mexican oranges to the value of $134,666; during the ten months ending April 30, 1899, to the value of $137,035, and during the twelve months ending with June, 1903, the importations amounted to about 6,000,000, valued at $87,407.

The shipments begin about September 1 and end on December 15. It ordinarily takes twelve days, moderately fast freight, to send cars from shipping points to Chicago or Cincinnati, although some cars have made the trip in eight days. The best shipping oranges are from Hermosillo, in the State of Sonora; Montemorelos, in the State of Nuevo León; Rio Verde, La Barca, and Guadalajara, in the State of Jalisco. The next grade is from Yautepec, in the State of Oaxaca; Michoacán and Atlixco, in the State of Puebla.

The boxes generally used for shipping are imported from the United States. One or two firms in México have attempted to manufacture orange boxes, but they have not succeeded in turning out a first-class quality. The cost of a box is 31 cents; of the wrapping paper, 15 cents per box (all of which is imported); cost of packing, 36 cents per box; freight and consular costs per box from Kansas City, St. Louis, Chicago, or Cincinnati, $2.04; and United States duties, under the new tariff act, 15 per cent ad valorem.

Below is given a table which is taken from the report of the United States consulate-general at México, above referred to, which shows the results that can be obtained from a small tract of land of 11 acres, 10 of which are planted in oranges.

Description.	Cost in Mexican currency.
Land (from $25 to $100 an acre)	$1,100.00
Houses, one of $350, another of $50	400.00
Farming implements	35.00
Clearing of land	77.00
Plowing land, 10½ acres, first year	21.50
Garden and seeds, half acre	10.00
Fencing and outhouses	60.00
Nursery (3,516 seedlings)	12.30
Two hundred Riverside navel trees, 80 cents each	160.00
Planting Riverside navel orange trees	4.00
Seven hundred cuttings, and planting in trench	14.00
Transplanting cuttings, second year	14.00
Transplanting 640 seedlings	12.80
Replacing, 10 per cent	1.30

Destination.	Cost in Mexican currency.
Plowing 120 acres, six years	$120.00
Irrigation, seven years	98.00
Weeding and cultivating, seven years, $40	200.00
Planting of corn, six years, 5 acres	15.00
Planting of beans, six years, 5 acres	15.00
Seed beans, $3, and corn, $1, six years, 5 acres each	24.00
Harvesting and shelling beans and corn, six years	60.00
Six hundred and forty buds	16.00
Manuring, six years	30.00
Total	2,579.90
Production:	
Six years' crops of corn, 300 cargas, at $3	900.00
Six years' crops of beans, 500 cargas, at $5	2,500.00
Two years' crops of Riverside navels, 120,000, at $4 per 1,000	480.00
One year's crop from cuttings, 21,000, at $4	840.00
Total	4,720.00
Less expense and cost of land	2,579.90
Net profit at end of seventh year	2,140.10

From the eighth year on the plantation will average from 576 to 600 oranges per tree, and on the tenth year 1,000 oranges per tree, at a yearly expense of $200 for the 10 acres. Two *peones* (day laborers) can do the general work of the plantation. These can be hired for from $1.50 to $2 per week each. From the tenth year forward a grower can have with all assurance a net income of $6,000 per year out of such size plantations if no plague or pests attack the trees, and in México the tree is not generally subject to any disease nor is it affected by any pests.

The production of oranges for 1901–2 is given in the following table from the "Anuario Estadístico" for the period in reference:

State.	Kilos.	Value.
Aguascalientes	13,800	$800
Baja California	62,250	3,500
Campeche	561,050	3,650
Colima	496,450	5,350
Chiapas	252,266	7,153
Durango	1,045,220	32,400
Guerrero	56,202	1,023
Hidalgo	314,336	3,576
Jalisco	8,638,971	304,163
Michoacán	1,403,683	24,026
Morelos	1,794,290	45,980
Nuevo León	740,580	31,816
Puebla	2,015,651	25,262
Querétaro	16,255	472
San Luis Potosí	850,562	21,421
Sinaloa	895,700	37,378
Sonora	1,785,370	139,060
Tabasco	233,107	8,125
Tamaulipas	91,120	7,308
Tepic	996,995	13,448
Zacatecas	808,305	7,691
Total	22,572,163	723,597

Some idea of the magnitude of orange growing may be arrived at when it is known that the plantation "La Eugenia" at Montemorelos, in the State of Nuevo Leon, contains 50,000 orange trees in bearing,

and 200,000 have been planted which will yield fruit in a few years. It is estimated that each tree on that plantation will yield two cases of oranges per annum, which will sell for $15 gold. In addition to oranges, fine lemons, grape fruit, and tangerines realize high prices in the New York market.

The lime, lemon, and sweet lemon are also much cultivated on the same lands that produce the orange, and they have become a large element in the country's exportations.

Pineapples.—The pineapple is also cultivated to a very great extent. It is easily raised and needs hardly any care after planting. It has been said that the cost per plant from the seed until ready for market is not over 5 cents. It has been estimated that 2½ acres planted in pineapples will easily produce 10,000 plants. The crop of corn which is sown among the pineapples will fully meet the expense of the cultivation of the fruit; thus the 10,000 pineapples, when planted in this way, will cost absolutely nothing. On the ground the fruit sells for about 38 cents per dozen, but exported to the United States they bring a good price, netting about $1,500 per acre under cultivation, and one man can easily cultivate 6 acres. With an outlay of about $1,200 gold a person can at the end of three years have from 15,000 to 20,000 bearing pineapple plants.

The total production in 1901–2 is officially reported at 2,046,119 kilos, estimated at $46,376, Tepic ranking first, Jalisco second, Hidalgo and Puebla coming next. Ten of the States are not listed in the statistics at hand.

The list of tropical fruits which México produces is too extensive to be incorporated here. Latest Mexican official statistics give the annual product of 79 different varieties of fruits.

Consul-General Barlow in his report before mentioned gives the names of American firms engaged in the fruit industry in México, there being 1 in Chiapas, 1 in Nuevo Leon, 1 in Tamaulipas, 14 in Oaxaca, and 13 in Veracruz.

Medicinal plants.—In an official list of the flora of the hot lands of México, prepared by the Government in 1893,[a] there are enumerated 233 distinct species of medicinal plants, as well as 14 dyewoods. Among the former may be mentioned the jalap root (*Ipomæa*) and sarsaparilla (*Smilax sarsaparilla* and *Smilax arenisca*), which grow wild, both of which occupied a very prominent place in the trade figures of the country some years ago, but which have recently assumed a secondary position. The total production of these plants in 1901–2, according to Mexican official figures, was as follows: Jalap root, 6,810 kilos, at $817, produced by the State of Hidalgo, the only State given, and sarsaparilla, 690,688 kilos, at $22,873, Oaxaca being credited with the largest production, nearly 607,000 kilos.

[a] Los Estados Unidos Mexicanos: México, 1893.

Dyewoods.—Among the dye-producing plants are the Brazil (*Cæsalpinia crista*) and Campeche (*Heamatoxylon chianum*) woods, dragons' blood (*Pterocarpus draco*), "Grana" (*Rubia tinctorea*), "Zacatlaxcala" (*Cuscuta americana*), "moral" (*Maclura tinctorea*), and indigo (*Indigofera*—two varieties), some of which are exported in considerable quantities. It has been estimated that the value of dyewoods exported by México is fast approaching the sum of $250,000 per month. Official figures for the year 1901–2 give the following estimates of the production of these plants during the year: Indigo, 81,892 kilos, valued at $168,239; Brazil wood, 3,016,742 kilos, at $28,697; Campeche or logwood, 15,092,250 kilos, at $515,275, and "moral" wood, 901,550 kilos, at $58,147. Chiapas is the largest indigo-producing State and Michoacán the second. Sinaloa and Michoacán produce the largest quantity of Brazil wood; Campeche, Yucatán, and Tabasco, logwood, and San Luis Potosí, Tabasco, and Sinaloa, moral wood. Exports of dyewoods during 1902 are quoted at 32,751,754 kilos, estimated at $993,167, the principal consumers being England, 22,254,000 kilos; Russia, 3,400,000 kilos; Germany, 2,000,000 kilos; British Honduras, 1,731,000 kilos; France, 1,540,000 kilos, and the United States, 1,371,500 kilos.

Fodder plants abound, the principal being the *pará* (*Chrysopagon avenaceus*), guinea grass, *alfalfa* or lucern, *ramón* (*Trophis americana*), and the *ojite* (*Brosinum alicastrum*). There are 445 classified species of graminaceous plants. A profitable crop for the irrigated lands of the plateau country is lucern. Green alfalfa retails in the streets of México City at 15 cents for 25 pounds. From five to nine crops can be raised yearly, and under good conditions the yield will be 10 tons per crop to the acre.

Woods.—There are immense quantities of building lumber and cabinet woods, many species of which are yet unknown in foreign markets, although they are classed among the most precious.

An official list of the woods in México in 1897[a] gives 200 varieties. Among the woods used as constructive material the principal are the "Algarrobo" (*Himenea courbaril*), "Almendrillo" (*Pomus occidentales*), "Ceiba" (*Eriodendon anfractuosum*), "Granadillo" (*Byra ebanus*), "Guanacastle" (*Lignum-vitæ*), "Guayacán" (*Guayacum verticale*), ironwood (*Robinia sp.*), "Mezquitillo" (*Cassia occidentalis*), "Ocote," yellow and white (*Pinus harborwegii* and *P. ayacahuite*), white oak (*Quercus jalapensis*), and several others.

Cabinet woods.—The following are among the principal cabinet woods in the country: Mahogany (*Suetenia mahogani*), "Caobilla" (*Croton lucidum*), cedar (*Cedrella odorata*), three varieties, one white and two red; ebony (*Dyospiros ebenum*), three varieties, one of them called green ebony (*Chloroxylon*); "Gateado" (*Suetenia sp.*), and rosewood (*Tecoma multiflora*).

[a] Anuario Estadístico de la República Mexicana, 1897: México, 1898.

IRRIGATION DAM NEAR IRAPUATO, STATE OF GUANAJUATO.

The yearly production of mahogany amounts on an average to about $1,200,000 Mexican silver, Chiapas, Tabasco, Veracruz, and Campeche supplying the greatest quantity of this valuable wood. One-half of the mahogany consumed in the United States comes from México. Cedar is found in all parts of the country, but the States of Chihuahua, Tabasco, and Veracruz contain the largest and most desirable forests of this wood, cutting annually cedar logs to the value of more than $1,000,000. With the exception of the State of Nuevo León, which cuts yearly more than 30,000,000 kilos of ebony, this wood is almost unknown commercially in the Republic; some, however, is produced in Tamaulipas, Guerrero, Hidalgo, and Yucatán. Puebla produces a greater quantity of aloe wood than any of the other Mexican States; Coahuila the most oak; Nuevo León the greatest quantity of walnut; the Territory of Lower California, ironwood, while the State of Jalisco is celebrated for its orange wood.

The exports of precious woods (mahogany, ebony, etc.) for the year 1902 is officially estimated at $1,362,731, the United States taking about $1,050,000.

Tanning plants.—Among the flora of this favored country are many trees, shrubs, etc., yielding tannic acid, among which may be mentioned the *cascalote* (*Rhus cariaria*), *timbe* (*Mimosa* sp.), mangrove (*Rhizophora mangle*), white mangrove (*Avicennia tomentosa*), and the *canaigre*. The first named produces a very excellent tanning material from its bark. The value of the exportations of this material for the fiscal year 1897–98 was $49,021.

The *canaigre* is a tuber, and resembles the sugar beet in shape, while the leaf is similar to that of the rhubarb or pieplant. It is indigenous to Sonora, Chihuahua, Coahuila, and Lower California. Of recent years it has been cultivated to a considerable extent in New Mexico and Texas; but not much attention has been paid to the industry in México, although it produces from 25 to 30 per cent of tannic acid. The root can be used not only for common tanning purposes, but also for fine saddlery and fancy leathers. It can be used alone or in connection with other materials. It is noted for its quickness and thoroughness in tanning, as well as for the color, beauty, consistency, and pliability imparted to the leather.

Canaigre is a dry-climate plant, but its growth is assisted materially by irrigation. Until quite recently the root had to be gathered by digging the wild plant, but experience has demonstrated that it can be successfully cultivated, and there is no question that it improves in size, quality, yield, and in percentage of tannic acid. The annual yield per acre is about the same as that of beets (60 to 80 tons). In New Mexico the cost of cultivation per acre is about $23.50, including irrigation and water rental; but in México, especially in the central and southern sections of the country, the rains will furnish all the necessary

moisture, thereby reducing very materially the expense. This plant has only attracted public attention as a commercial product within the past five years, and it would seem that those employed in agricultural pursuits in the neighboring Republic would do well to add one more item to their productions, for it is evident that the market for *canaigre* is practically unlimited, since the oak and hemlock barks, so extensively used in the tannic industry of the United States, are becoming very scarce, and the price of tannin is constantly on the increase.

According to Mexican official statistics for 1901–2, the production of tanning plants amounted to 16,540,075 kilos, valued at $471,455 silver, the production of "Cascalote" being represented by 2,966,156 kilos for $132,813.

OTHER PLANTS.

Yucca, also called *manioca* in South America—two varieties, the sweet (*Jatropha manioc*) and the bitter (*Manihot utiliss.*)—is a shrub about 4 feet in height, with from 6 to 10 tubers to each plant, weighing from 1 to 12 pounds each. It is an important product of the State of Chiapas. It commences to yield, in good soil, one year after planting. The tubers, besides yielding starch, furnish food to man and cattle. Two and a half acres of land will yield 6,000 pounds of tubers, which will produce 3,000 pounds of starch.

Sugar beet.—The States of Chihuahua, Coahuila, Durango, Zacatecas, San Luis Potosí, and some others of the northern-central part of México include many districts which are eminently fitted to produce the sugar beet. This industry has not as yet taken any firm root in the country.

Ginger (*Zenziber officinalis*) grows wild in various parts of México, and if properly cultivated ought to yield 4,000 pounds per acre, according to Romero.

The Mexican *linaloe* (*Amyris linaloe*) is a large tree, the wood being soft and of a very light-yellow color. The bark exudes a resin called "*xochiopal.*" The wood has a very pleasant odor, which is compared to that of a mixture of essence of lemon and essence of jasmine, and upon distillation yields from 6 to 9 per cent of a very light-yellow essence. The tree abounds in the southern parts of the States of Puebla and Guerrero, and it is reported to grow also in the tropical portion of the Pacific slope of México at the same altitude as in its habitat in Puebla and Guerrero. A good deal of the essence is sent to the city of Puebla, which is one of the chief markets in México for the product. It is worth $75 silver ($28.78 gold) per arroba (4.263 gallons). The process of distillation is careful, but very primitive and inexpensive. Sticks of the linaloe about the length and thickness of medium-sized cord wood, are supplied to the laborers, each of whom has a little inclosure contiguous to the still. These laborers reduced the sticks to small, thin chips, and these chips, without further process, are placed

in the still. The linaloe essence is the article exported. The major part goes to Hamburg and some to Havre, and now and then a shipment goes to New York. It is largely in demand as the base of exquisite perfumes.

Native methods.—The modes of cultivation in México in many places still differ but little from those employed by the ancient Egyptians. This, of course, does not refer to large plantations, where in the last few years the proprietors have introduced modern methods and agricultural machinery. But among the small landholders and the Indians wooden-beam plows, with a small iron shoe, are still used. These make a furrow 5 inches wide by 5 deep. A hoe is also used, which often weighs from 3 to 5 pounds. A saw-tooth sickle completes the outfit with which the ordinary Mexican crops are raised and gathered. The plow is nothing more than a forked stick, the shorter fork being iron shod and sharpened; the longer is lashed with rawhide thongs to the yoke of oxen that draws this prehistoric implement. It takes about four men and four yoke of oxen to do the work of one man and one horse.

Up to within a very short period (and it is the case at present, except on the largest plantations) all thrashing of grain was done by driving horses or mules around in a ring upon the straw which is on the ground. The winnowing is done by men tossing the grain and chaff in the air with scoop shovels. Mexicans, as a rule, object to thrashing machines because they leave the straw whole, while by employing their method the constant trampling cuts it up as fine as though run through a feed cutter, and as straw is universally used as feed any further preparation is unnecessary.

The grain is transported from the field to the farmhouse or station on ponderous two-wheeled carts, there being 3 pounds of cart to 1 of load for the oxen to pull. Better facilities for communication between the United States and the neighboring Republic have changed some of these methods, as before stated; but there is still one drawback to the general use of improved American agricultural machinery in the country, which, however, is gradually disappearing by the establishment of machine-repairing shops. The machinery, as a rule, is costly and unfamiliar, and should any part of it break, rare is the Mexican blacksmith who can repair it, as usually the broken part is of cast iron, and the distance from the manufactory causes long delay and heavy expense.

Official statistics give the number of *haciendas*, or plantations, in the Republic in 1897 at 8,101, devoted to the cultivations following: Cereals, 3,400; sugar cane, 1,395; henequén, 395; coffee, 373; maguey (*pulque*), 279; cacao, 239; cotton, 135; maguey (*mescal*), 134; tobacco, 92; cabinet woods, 69; indigo, 29; fruits, 6; grapes, 5; and 1,560 devoted to cattle raising.

CHAPTER VIII.

STOCK RAISING.

The raising of cattle has always been one of the most important industries of México, and one of the least restricted by the Spaniards of the eighteenth century, who, by means of special legislation, gave encouragement to it to the extent of making it the favorite occupation of the inhabitants of the country. In earlier times cattle were of little value except for their hides, which formed an important item of export; later, however, they were turned to better advantage, the hides being manufactured into leather and the tallow used for the manufacture of soap. During the eighteenth century sheep raising also became an important industry in the northern and central provinces.

The States of the northern frontier are so well adapted to such purposes that they may be said to be immense cattle ranges. The excellent situation of the lands, as well as their generally well-watered condition, will, as has been said by persons who have given study to the matter, make México a formidable rival of the Argentine Republic.

Although the population of the United States has increased surprisingly within the past few years, there has been a large falling off in the number of cattle. Statistics show that there has been a diminution of 8,000,000 head of cattle within that period, so that it can be readily seen that cattle raising for the market in the neighboring Republic presents alluring prospects. Considerable interest has been manifested of late in this industry, and the Mexican railroad officials have been endeavoring to build it up, with marked success.

Mexican cattle as a rule are small in size, ranging between 900 and 1,200 pounds in weight. This latter weight is considered in the English market as small, and the suggestion has been made by British traders that it would be wise for the Mexican cattle raisers to import English Shorthorn bulls for the purpose of breeding larger cattle. The Department of Promotion has taken a deep interest in this subject, and many reforms have been introduced to the betterment of the stock. Cotton-seed meal is one of the prominent products of México, and, although it is one of the foods to be relied on chiefly for fattening cattle, nearly the entire output of this article is sent every year to the United States and Europe.

It has been estimated that the total cost of fattening a steer is about $15 silver, and as there is an unlimited demand in Europe for choice meats at about 12 cents gold per pound, and no import duties to be paid, it can readily be seen that there are large benefits to be derived from the industry of cattle raising.

The States of Durango, Sonora, Chihuahua, Nuevo Léon, Coahuila, Tamaulipas, Veracruz, and Michoacán present admirable fields for the development of this great industry. The rich pasture lands of the latter State feed the thousands of cattle for the sustenance of the residents of the capital of the Mexican Republic.

Some of the States are not well provided with water, but it has been demonstrated that with small expense all the necessary water can be obtained by the boring of wells. In the State of Guanajuato a company, under the patronage of the State government, some years since bored wells and began the breeding and fattening of cattle on a large scale. The country around Tampico is wonderfully rich, the grass growing waist high there all the year round. It is deserving of investigation by those contemplating going into the business of cattle raising.

In the northern and eastern part of the Republic, lean stock can be bought at from $5 to $15 per head, and sold when fattened at from $20 to $45 per head. San Luis Potosí, southern Tamaulipas, and northern Veracruz are well adapted to cattle raising. The *pará* grass grows here in abundance. It is evergreen, very nourishing, and is a weed exterminator. It has been estimated that an investment of $30,000 gold in this industry will yield a net profit of $20,000 in six months.

México raises great numbers of cattle for the United States, and does so under better conditions of climate than the latter country, for the stock raisers of this country lose thousands every year, owing to the rigorous winters and severe summers.

According to statistics compiled by the United States Bureau of Animal Industry, 63,560 cattle were exported from México to the United States in 1902, against 99,975 in the previous year. Of the 8,868 cattle exported from México to the United States during December, 1902, 7,627 were shipped to California for grazing. Mexican cattle are received into the United States at the ports of entry at Eagle Pass, Nogales, El Paso, and San Diego.

The exportation of raw hides is a growing trade in México, of which the United States is the greatest consumer. During the fiscal year of 1901–2 the value of the hides exported to the United States amounted to $3,489,647, as compared with $2,668,369 exported to that country in the fiscal year 1900–1901. During the first four months of 1902–3 the declared value of the hides exported was $1,863,707.10, more than one-half of which was consigned to the United States.

Cuba is becoming a very important market for Mexican live stock,

the following being the approximate price (Spanish gold) paid for Mexican cattle at Habana:

	Per head.
Bulls 4 to 6 years old	$30 to $32
Bulls 2 years old	20 to 22
Heifers 2 years old	19 to 21
Sterile cows under 10 years old	25 to 26
Breeding cows	28 to 30
Mares, fat, unbroken	25 to 28
Horses, unbroken	35 to 40
Mules, unbroken, 4 to 6 years	40 to 50

The number of cattle exported from México during the five fiscal years ending June 30, 1902, is estimated as follows:

1897–98	227,000
1898–99	100,000
1899–1900	184,000
1900–1	197,000
1901–2	161,000

Importation of many pure-bred cattle from the United States into México is resulting in marked improvement in the long horn native type. It is the prevailing opinion that a cross between the pure-blooded cattle of the North and the native stock produces a large, healthy, vigorous offspring, with an unusually compact muscular development.

A Mexican writer on stock raising is authority for the following data in regard to the facilities offered by Mexico for stock breeding:[a]

"In the foothills of both coasts, where pasturage is more luxuriant, and consequently can support many more head per acre than in the northern districts, ranges can be purchased at a much lower figure per head of cattle than in the North. That is to say, $10,000 judiciously invested in the pasture lands in the foothills of Tepic, Jalisco, Michoacán, Guerrero, Veracruz, Hidalgo, San Luis Potosí, or Tamaulipas will maintain more cattle than the same amount invested in pasture lands in Chihuahua, Durango, Coahuila, northern Zacatecas, or Sonora, although the number of acres will be less.

"On the Gulf slope of the eastern Cordilleras, in the State of San Luis Potosí, eastern Tamaulipas and northern Veracruz, is a region known as the Huasteca Potosina, lying tributary to the Tamesi and Panuco rivers and to the Tempoal and Tamasunchale, tributaries to the latter. The Huasteca begins where the plains which border on the coast end, a succession of valleys separated by verdure-covered terraces or hills increasing in height as they recede to the westward, rising within a distance of 100 miles from sea level to that of the central plateau, 6,000 feet above. This slope, with its valleys, receives the moisture of the breezes from the Gulf in the form of rain during the summer months and dew during those of fall and winter, rendering them practically free from frost, drought, and excessive heat.

[a] Bernabé Collado, in "Modern Mexico," November, 1903, and February, 1904.

"The natural pasturage lands of the Huasteca foothills are as fine as any in the world. The rains of summer and the heavy dews of autumn and winter, even in the driest months (April and May), are sufficient to prevent any notable deterioration in the quality of pastures.

"The South American and African grasses, pará and guineo, develop and flourish wonderfully in these foothills and are extensively planted.

"The upland pastures of the central table-lands adapted to the breeding of stock are not sufficiently fertile to fatten more than a fraction of the cattle that can be raised on them. The large interior markets of Puebla and the City of México, as well as Yucatán, which are the greatest purchasers of cattle raised on the eastern coast of México, and the great mining camps of the Republic, have maintained the price of beef cattle at figures which have made the industry immensely profitable. The exportation through the port of Tampico by sea is, according to the latest figures available, 75,000 annually. This, however, does not take into consideration the large numbers shipped north into Texas for fattening and southwest by rail to the interior markets of the Republic.

"The ranges of the Pacific slope, through the territory of Tepic, Jalisco, Michoacán, Guerrero, and southern Oaxaca, are quite different in character from those of the Gulf coast, the dry season on the Pacific slope being more rigorous than on the east. The aggregate amount of rainfall is but little less, but it is not so evenly distributed, so that greater provisions have to be made for water holes, tanks, etc. There is never a scarcity of pasture; but unless pains are taken to provide unfailing supply of water, well distributed over the range, it will sometimes happen that the pasture in the vicinity of the water holes will be all eaten up, as the more broken character of the country in the western slope makes it difficult for cattle to go great distances for water. Although the western ranges are quite as accessible to the home markets as those of the Gulf coast, they are much farther away from foreign markets, as on the Pacific coast of the United States there is a comparatively small demand for beef, and for shipment to Texas, on account of the distance, purchasers prefer to buy on ranches nearer the border.

"For these reasons pasture lands are held at lower figures through the Pacific slope of Michoacán, Guerrero, and southern Oaxaca than they are in the Huasteca, making it possible with an equal investment of capital to pasture a larger number of cattle.

"At the beginning of the year 1903 there existed in the Republic, according to the returns made by the assessors, 3,424,430 sheep, with a valuation of $6,037,306. The possibilities are, however, that this return does not represent more than 65 or 70 per cent of the sheep actually existing in the Republic, the valuation also being very low. Sheep on the range are worth from $2.75 to $4 per head, according to their quality.

"The principal sheep-raising States of the Republic are Zacatecas, with 827,000 head; San Luis Potosí, with something over 400,000 head; and the following States raising over 100,000 head: Coahuila, Chihuahua, Durango, Guanajuato, Hidalgo, México, Michoacán, Nuevo León, Puebla, Tamaulipas.

"With the exception of Tamaulipas, which is in the extreme northeastern part of the Republic, all of the sheep-raising States are partly or entirely located in the great central table-land.

"Experience has demonstrated that although cattle apparently do better and are more profitable in the rank pasture lands of the coast ranges, that to be successful with sheep it is necessary to confine one's operations to the arid plains of the high lands.

"Experiments have been made with sheep raising in the pará grass regions of the foothills, and although in many instances for the first two or three years the herds are healthy and multiply rapidly, before long some of the epidemics due to overfeeding and damp soil break out.

"On the table-lands, however, sheep are apparently exempt from epidemics, and the loss from predatory animals is comparatively insignificant.

"When sheep are ranged over rented pasture, from 8 to 15 cents annually is paid per head, according to the abundance of pasturage.

"It has been found by experience that in order to produce a fair quality of wool it is necessary to constantly improve stock by the introduction of graded or pure blood rams from Europe or the United States. Unimproved native stock which has been on the range for a series of years will not average much over the pound of wool per head annually, but graded stock will give from 2 to 8 pounds a head per year, according to age, class of pasture, and the quality of the sires.

"It has also been found that the sheep degenerate very fast; in other words, that a flock of sheep that has been graded up so that it will produce 8 pounds per head per annum the first year will gradually decrease in production every year until it is a little above that of the unimproved native stock.

"Some of the most intelligent sheep breeders make a practice of importing every year a certain number of Merino rams, which are most generally used for improving the range sheep, with the idea of keeping their flock up to a certain standard.

"The breeding ewes average from one and one-quarter to one and one-half lambs per annum. Shepherds who take care of the sheep on the range receive from $6 to $10 a month, and a small ration worth $4 in excess of their monthly wages. The price of sheep purchased for butchering, on the range, varies between $3.75 and $4.50. In México they are worth between $4.50 and $5.50 per head.

"The Mexican wool is coarser than the better grades of United States merino wool."

Hog raising is said to be one of the most profitable industries in

which the Mexican agriculturist can engage. The native hog is hard to fatten, but by the importation of improved stock this drawback may be promptly overcome. Of recent years breeders have been doing this, and a marked advance has been made in the industry.

The Federal District possesses fine pasture grounds, and the cattle industry is there carried on extensively, a large local trade in dairy products being one of the features of that section.

The Mexican Government has given a concession for the privilege of establishing a permanent exposition and market for the sale of cattle to be located within the limits of the Federal District. The concessionaire is to invest $300,000, or $135,000 gold. Accommodations are to be provided for 5,000 head of beef cattle, 10,000 hogs, 5,000 sheep and goats and 1,000 head of horses, mules, etc. The construction is to be completed in five years, and the concession is to last for fifty years.

The Department of Promotion in México has compiled statistics relative to cattle in the year 1902 containing many details, such as the geographical situation of each zone, elevation above the sea, number and value of cattle, distribution in States, etc. The statistics embrace not only bovine stock, but also horses, mules, asses, sheep, goats, and hogs, and show the estimated number and value of each class in the Republic at the beginning of 1903, as follows:

Class.	Number.	Value.
Cattle	5,304,165	$84,251,275
Horses	872,544	10,997,667
Mules	340,016	10,742,478
Asses	298,416	2,470,547
Sheep	3,458,124	6,096,068
Goats	4,240,886	7,303,289
Hogs	641,074	2,194,457
Total	15,115,225	124,055,801

The States which, according to these statistics, are at the present time the greatest cattle producers are Jalisco, Chihuahua, Guanajuato, Michoacán, Veracruz, Durango, Zacatecas, and Yucatán, as may be noted in the following table, which shows the value of the cattle produced in each State of the Republic:

State.	Value.	State.	Value.
Aguascalientes	$2,302,490	Nuevo León	$3,393,625
Baja California	1,042,121	Oaxaca	1,786,439
Campéche	1,225,334	Puebla	4,309,904
Coahuila	4,124,472	Querétaro	1,705,097
Colima	987,048	San Luis Potosí	4,786,411
Chiapas	3,310,807	Sinaloa	1,330,078
Chihuahua	9,215,465	Sonora	4,212,861
Distrito Federal	1,137,297	Tabasco	2,838,422
Durango	7,573,741	Tamaulipas	3,961,152
Guanajuato	8,840,537	Tepic	2,356,696
Guerrero	2,858,608	Tlascala	974,471
Hidalgo	1,136,536	Veracruz	8,239,375
Jalisco	13,333,922	Yucatán	6,075,239
México	3,583,365	Zacatecas	6,324,289
Michoacán	8,548,954	Total	124,055,801
Morelos	1,526,045		

Consul-General Barlow, in his report before mentioned, gives the names of 60 American firms engaged in cattle breeding in México.

The number of stock slaughtered for consumption in the Republic in the year 1902 is, according to the "Anuario Estadístico," as follows:

Stock.	Heads.	Weight.	Value.
		Kilos.	
Beef cattle	938,583	154,965,554	$41,976,990
Sheep	572,971	10,466,263	2,887,134
Goats	1,081,256	17,296,711	2,936,215
Hogs	778,618	43,358,934	14,194,449
Total	3,321,428	236,087,462	61,994,788

The consumption in the Federal District alone amounted to 351,161 heads valued at $7,415,645.

CHAPTER IX.

MINES AND MINING, MINING LAWS, TAXES, ETC.

Nature has richly endowed Mexico with resources well-nigh countless, but in the bestowal of mineral resources she has been most lavish. Beneath the surface of that volcanic ridge raised between two great bodies of water lie buried treasures incomparable, and although innumerable mining enterprises have for nearly four hundred years exploited the metal-bearing regions and have extracted fabulous quantities of precious metals, by far the greater part is yet to be laid bare.

At the beginning of the last century Humboldt estimated the mines in Mexico to number 3,000. In recent years hardly that many have been worked, but the extension of the railroads and the bringing into closer communication of remote sections of the country have brought about a revival of the interest in this great industry.

The great mining region runs from the northwest to the southeast, following the direction of the Sierra Madre cordillera, extending from Sonora to the south of Oaxaca, a distance of about 2,574 kilometers. The immense parallelogram this region forms has a width of about 402 kilometers.

The richest mines have been discovered on the western slope of the cordilleras at an elevation of about from 915 to 2,440 meters above sea level.

Most of the historical mines are situated here, having been opened up by the Spaniards in 1526 and worked until 1700, with little formality and less science.

The English first undertook mining operations in 1824, and conducted them for ten years with no very profitable results.

DISTRIBUTION OF MINERALS.

In Chihuahua numberless mineral districts are known to exist containing copper, lead, mercury, silver, salt, and coal mines. Other minerals usually accompany the substances named, such as iron, zinc, antimony, arsenic, etc. In the district and near the city of Chihuahua is the celebrated Santa Eulalia mine, one of the oldest in the country, the products of which have left a monument in the very handsome parish church of San Francisco, erected in the city between the years 1717 and 1789 with the proceeds of a tax of 1 *real* (12½ cents) on each

half pound of silver got from the mine. The total sum thus secured is stated to be $800,000. During the early part of the year 1897 at the properties of the Gold Hill Mining Company, in the southwestern part of Chihuahua, the result of an experimental run of 100 tons of tailings from the surface ore of the Rosario mine was a 30-ounce bar of gold. So primitive were the methods employed by the original workers of the greater part of the Mexican mines that the Indians often make a fair living by working over the tailings.

Sonora is one of the richest as well as most important mining centers. It is noted for its high-class metals, among which are gold, silver, mercury, and iron. Here abound the soft or lead ores, which are so easily worked and aid so materially in smelting. There are also other minerals, such as asbestos, copperas, magnetic iron ore, muriate and carbonate of soda, and saltpeter. Native silver is found in these districts in considerable quantities, and native iron has also been discovered in the Sierra Madre, Papaguería, and the vicinity of the Colorado River.

Sonora has been turning out plenty of gold, the output having increased since the Yaqui Reservation has been thrown open. Rich placers are known to exist there, and it is expected that the influx of prospectors will be great in the near future. Over 200 prospectors went into the Yaqui country in August, 1897, and it is stated that an Arizona miner came out recently with $80,000, the product of the work of three men during three months.

Sinaloa has also more than 700 mining districts, the mineral deposits being classified into six formations. Calciferous and quartz ore prevail, with silver in a native state or combined with sulphur, antimony, and arsenic, with more or less traces of gold. Veins of gold-bearing quartz exist in some localities, and deposits of iron ore, sulphite of lead, zinc, copper, and silica are to be found.

The districts of Durango run mostly to silver, yet many other metals exist, such as talc and iron, the latter being found in inexhaustible quantities in the Cerro del Mercado, which is a solid mass of iron, averaging 66 per cent pure. This deposit was discovered in 1562 by Vásquez del Mercado. The *cerro*, or hill, is 4,800 feet long, 1,100 feet wide, and 640 feet high, and according to calculations, over 300,000,000 tons of solid iron might be extracted from it.

Jalisco is another silver-producing region, and furnishes also copper and lead ores and coal.

Of the 96 districts in Michoacán only 56 were worked in 1902, due to the very limited population of the State and lack of the necessary capital. The principal deposits are of copper. In 1897 a company was formed in London, with a capital of $400,000, to carry on a general mining business in the Ario and Morelia districts of Michoacán.

Zacatecas is the great silver-producing State. It is estimated that

in the last three centuries its many mines, which were first worked by the Spaniards in 1540, but which had previously been worked in a rude way by the Indians, have yielded over a thousand million of dollars.

Guerrero has always been considered as one of the richest mineral sections of America. Prospectors heretofore have been compelled to abandon rich discoveries on account of a lack of transportation facilities and scarcity of labor. The construction of the Mexico, Cuernavaca and Pacific Railway has opened up this wonderful country, with the result that large American companies have sent experts to investigate the marvelous wealth of this belt, which is comparatively unknown. Many natives in the State named make a living by washing out placer gold in the crudest possible manner. Experts announce that there is an abundance of gold in this portion of the country, and that the only need is the presence of intelligent prospectors to find it. The gold runs from 10 to 12½ ounces to the ton. Copper is very abundant, and there are also rich carbonate of lead ores.

The State of Oaxaca has long been recognized to be rich in gold, and much work has been done by the *arrastra* system, by which a good deal of the metal was lost in the tailings. There is the best authority for the statement that some dumps there contain thousands of tons which will assay as high as an ounce to the ton.

Guanajuato is another far-famed silver-producing State, and has been and still is the center of great exploitation. The district bearing the name of the State was discovered in 1548, and has been worked almost continuously ever since that date, the output of its mines reaching fabulous figures. Native gold has been discovered in this district, and the late denouncing and registering of mines has disclosed the presence of other minerals, such as tin and bismuth. Prospecting is still going on, and not unfrequently is the news of another rich strike heralded abroad. The estimated annual output of the mines is $6,000,000.

In the mineral district of Querétaro are to be found lead metals, cinnabar, and the ever-present silver. The mines are numerous and important. The celebrated San Juan Nepomuceno, or El Doctor mine, is situated here, in the Cadereyta district. It is one of the oldest and richest of México, its production being so great two hundred years ago that it paid the Spanish Government $18,000,000 in taxes. It is in this State that the fine opals, which reflect every prismatic color and are much sought after, are found. Great beds of these stones exist on the celebrated hacienda of La Esperanza. The opals from this place are sold in the City of México by itinerant venders at remarkably low prices.[a] The most important deposit of these stones produced some years ago from $80,000 to $100,000 a year.

[a] Large opals can be bought in Querétaro for $2 each, and small ones for 50 cents.

The State of Morelos has but one mineral district worthy the name, that of Huautla, which, like most of those in the country, is silver producing.

Puebla's districts yield native gold, silver, oxide of manganese, and pyrites, as well as coal and iron ore. Here also exist quarries of beautiful onyx and what is known as Puebla marble. This onyx is much used in the United States for decorating houses and in the jeweler's trade. In the mountains bordering on the States of Zacatecas, San Luis Potosí, Coahuila, and Nuevo León extensive quarries of onyx and marble of most beautiful colors and varieties, equal in every way to the Puebla product, are being worked.

Among the mineral regions in the eastern cordillera, that of Zomelahuacan, in the State of Veracruz, deserves mention, three classes of metal being found there—lead, argentiferous copper, and iron. Gold nuggets have been secured there also, as well as very rich malachite in scattered veins, the mother vein not having been discovered up to date.

The State of México is rich in mines of native gold and silver, as well as those of copper, iron, oxide of iron, and manganese.

The Territory of Lower California is rich in minerals. The peninsula is barren and without water. The mountain ridge forming the backbone of the peninsula is a continuation of the coast range of Upper California and is interwoven almost over its entire extent with metallic veins of all descriptions. Near San José and Cape St. Lucas there are argentiferous and auriferous outcroppings and in the municipalities of La Paz, El Triunfo, and San Antonio veins of gold, silver, iron, and other substances are exhibited on the surface of the mountains.

In the districts of Comondú, Loreto, San Luis, and Mulejé, in the northern part of the peninsula, rich copper mines abound. The Boleo mines, situated in this part, have for years been the chief source of the copper supply. There are also other metals, such as mica, iron, tin, and oxides of iron, besides gypsum, enormous piles or hills of which are to be found, marble, alabaster, and sandstone. Gold was discovered near Santa Gertrudis, north of Mulejé, about 1884, and it is said that the mountains and gulches in that vicinity have rich veins of this metal.

In this district there are also solid mountains of iron. The frontier district of Lower California is noted for its gold diggings and ledges, mica, and other mineral substances, such as sulphur, soda, and salt. American capitalists are largely interested in this region.

Besides the minerals named, there are in the peninsula plumbago, sulphuret of lead, porphyry, prismatic pyrites, sulphur, oxide of antimony and lead, carbonate and phosphate of lead, hydroxide of iron, and hydrosilicate of copper. Near Todos Santos some lime quarries exist.

The State of Hidalgo deserves more extended mention here, as it was in one of its districts that a miner discovered the *patio* process for reducing ores—a process which to this day is most in use in México, and one which no miner or mining engineer has been able to supersede by a more economical one for reducing the peculiar ores in which that country abounds. The great mineral district of this State is situated in the vicinity of Pachuca, the principal mines being the Real del Monte, Atontolico el Chico, and Zimapán.

Pachuca, with its rich cluster of mines, lies on a plain about 60 miles from the City of México, and is one of the oldest mining centers in the country, having been worked for more than three and one-half centuries. The district within which it lies now has a population of 100,000, a large proportion of which is Indian miners. It was here that the *patio* process of amalgamation was discovered by the celebrated Mexican miner, Bartolomé de Medina, in 1557. The very *hacienda de beneficio*, or reduction works, where this discovery was made are still to be seen in the town.

Sulphate of silver is the prevailing metal, although native silver mixed with ore is found in some of the mines of this district. Most of these mines, as well as those in other States, are still operated in the primitive Mexican fashion. The metal is brought up in rawhide sacks by means of ropes made of the fiber of the maguey wound about a large malacate (horse or mule windlass), and the peons or laborers carry pieces of ore weighing sometimes between 100 and 200 pounds on their backs from "headings" of the levels to the main shaft. Some foreigners are employed in the mines of Pachuca and elsewhere at good wages, but they generally are superintendents, engineers, bosses, etc.

There are in the Republic abundant sulphur deposits, particularly those of Popocatapetl, Pico de Orizaba, and Tajimaroa, several deposits of salt, rock crystal, marble, jasper, fine building stone, and the beautiful onyx of Tecali.

The most celebrated salt deposits of México are those of Peñón Blanco, in San Luis Potosí, their product containing from 70 to 80 per cent of chloride of sodium. On the coasts of both oceans there are also a great number of salt mines, the most useful being those of Yucatán, whence comes the salt for reducing the product of the mines of Hidalgo.

México also has deposits of precious stones, such as the opal, topaz, emerald, agate, amethyst, and garnet. It is related that one of the heroes of Mexican independence, General Guerrero, possessed some diamonds which had been given him by one of his soldiers, who had found them during an expedition in that part of the Sierra Madre running through the State of Guerrero. The field or locality whence came these precious stones, of which the General gave but vague information, has been vainly sought by various prospectors.

The most interesting fact in connection with the mining industry of México is the recent increase in her gold output. In 1893 the value of the gold produced was only 3¾ per cent of that of the silver. In 1894 it rose to about 14 per cent; in 1901–2 it was 20 per cent.

Exports of gold bullion.—The exports of gold bullion from México since 1888–89, according to Mexican official figures, have been as follows:

Year.	Value (Mexican silver).	Year.	Value (Mexican silver).
1888–89	$349,506	1895–96	$5,246,418
1889–90	457,608	1896–97	5,858,366
1890–91	612,618	1897–98	6,364,308
1891–92	751,407	1898–99	7,347,760
1892–93	357,887	1899–1900	7,225,615
1893–94	155,954	1900–1901	8,738,263
1894–95	4,139,645	1901–2	9,141,294

The late Don Matías Romero, when Mexican Minister at Washington, predicted that México is destined to become one of the largest producers of gold in the world, basing his prediction on the fact that heretofore the mining of gold has been merely an incident of the extraction of silver, and that when the amount of yellow metal in silver was small it was not separated; but since the value of gold has appreciated to so great a degree the mining of the metal has assumed much larger proportions.

Silver production.—As regards the production of silver, according to the "International Economist," of Berlin, quoted by the Consul-General of the United States at Frankfort in his report of November 29, 1899: "Enormous quantities of silver still come from the chief producing countries—México and the United States—and México especially seems to be inexhaustible." The figures given for México, in the article quoted, are as follows:

Year.	Ounces, fine.	Year.	Ounces, fine.
1896	45,710,982	1898	56,738,000
1897	53,903,180		

Exports of silver bullion.—The exports of silver bullion since 1888–89 are as follows:

Year.	Value (Mexican silver).	Year.	Value (Mexican silver).
1888–89	$6,629,260	1895–96	$26,345,160
1889–90	7,259,956	1896–97	32,137,257
1890–91	6,751,217	1897–98	35,721,275
1891–92	6,559,668	1898–99	40,429,954
1892–93	5,148,202	1899–1900	52,116,284
1893–94	8,130,823	1900–1901	53,086,016
1894–95	18,803,867	1901–2	48,021,133

Mineral production.—Data collected from official and other sources for the mineral production during the fiscal year 1902–3 show the following condition of the mining industry in the Republic.

The extent of mining properties under operation for the fiscal year ending June 30, 1903, together with the classification of the ores, was as follows:

Ores.	Number of properties.	Hectares.	Ares.
Gold	1,298	17,497	10
Gold and silver	4,345	41,674	47
Silver	4,904	42,182	44
Gold, silver, and copper	720	13,212	43
Gold, silver, and lead	712	8,363	49
Gold and copper	218	3,894	72
Silver and copper	624	9,780	5
Silver, copper, and lead	255	3,624	57
Silver, lead	2,723	28,792	82
Silver, manganese	4	55	.....
Silver, mercury	6	65	58
Antimony	47	2,008	72
Sulphur	94	2,975	87
Copper	765	22,483	89
Copper, iron	151	2,570	55
Copper, lead	22	568	30
Tin	30	727	.....
Iron	265	7,392	7
Manganese	13	237	.....
Mercury	146	4,720	22
Nickel, cobalt	1	3	.....
Opal	17	43	75
Lead	61	696	47
Sal gem	4	110	.....
Tellurium	1	4	.....
Turquoise	1	3	.....
Zinc	1	15	.....
Total	17,428	213,701	51

Distribution.—The distribution by States of these mining properties is shown in the following table:

	Number of properties.	Hectares.	Ares.
CENTRAL STATES.			
Aguascalientes	188	997	13
Durango	2,558	22,924	49
Guanajuato	764	9,478	62
Hidalgo	542	4,116	98
México	376	4,980	18
Morelos	55	680	34
Puebla	143	1,826	88
Querétaro	125	1,954	48
San Luis Potosí	349	7,484	76
Tlaxcala	8	80	9
Zacatecas	1,512	15,825	86
Total	6,615	70,299	67
NORTHERN STATES.			
Coahuila	519	10,239	69
Chihuahua	2,814	30,853	68
Nuevo León	494	9,636	32
Sonora	2,299	40,528	84
Total	6,126	91,258	53
GULF STATES.			
Tamaulipas	89	2,021	32
Veracruz	51	778	60
Total	140	2,799	92

	Number of properties.	Hectares.	Ares.
PACIFIC STATES.			
Lower California Territory	555	5,357	25
Colima	26	471	.....
Chiapas	18	274	90
Guerrero	595	8,265	78
Jalisco	851	6,149	68
Michoacán	419	11,900	54
Oaxaca	1,082	8,820	17
Sinaloa	786	6,588	27
Tepic Territory	215	1,566	70
Total	4,547	49,343	39
RECAPITULATION.			
Central States	6,615	70,299	67
Northern States	6,126	91,258	53
Gulf States	140	2,799	92
Pacific States	4,547	49,343	39
Total	17,428	213,701	51

Number of mining properties with respective titles on June 30, 1903	17,428
Number on June 30, 1902	14,539
Increase	2,889

Extension of the properties held—	Hectares.	Ares.
June 30, 1903	213,701	51
June 30, 1902	172,696	80
Increase	41,005	71

Value of mineral production.—The value in round numbers of the mineral production of México in the fiscal year 1902–3 was as follows:

Silver	$82,300,000
Gold	32,500,000
Copper and copper ores	19,600,000
Lead and lead ores	5,670,000
Antimony, antimony ores	1,139,000
Asphalt and coal	35,000
Other minerals	150,000
Marbles	200,000
Total production in 1902–3	141,594,000
Mineral production fiscal year 1901–2	113,057,000
Increase	28,537,000

The figures relating to gold and silver embrace the amounts exported and used for coinage in mints, exclusive of the minerals applied to home commercial consumption, such as quicksilver, iron, copper, lead, etc., and also the gold and silver used in the home industries.

Claims.—The number of mining claims registered during the calendar year 1902 was 16,430, covering 196,225 hectares, and embracing the following mineral substances:

Mineral substances.	Mining properties.	Area, hectares.
Gold	1,195	18,881
Gold and silver	3,892	85,255
Gold, silver, and copper	642	12,618
Gold, silver, and lead	630	7,403
Gold and copper	194	2,641
Silver	4,882	41,744
Silver and copper	615	9,470
Silver, copper, and lead	224	3,339
Silver and lead	2,616	27,985
Silver and manganese	8	35
Silver and mercury	5	49
Copper	745	22,193
Copper and lead	25	545
Copper and iron	126	2,350
Lead	61	714
Iron	227	5,692
Tin	25	501
Mercury	146	4,776
Zinc	1	15
Antimony	53	2,119
Manganese	9	95
Sulphur	90	2,657
Tellurium	1	3
Turquoise	1	4
Opal	18	45
Sal gem	4	110
Total	16,430	196,250

It is stated upon reliable authority that while México has produced a fabulous amount of the precious metals during the past four hundred years, there are still many sections of the country where the ground has not even been broken.

Exports.—The exports of copper and copper ores per month in the fiscal year 1902–3 were as follows:

	Copper.		Copper ores.	
	Quantity.	Value.	Quantity.	Value.
1902.	*Kilos.*		*Kilos.*	
July	1,861,411	$485,366.25	1,253	$105.00
August	5,762,546	1,933,001.16	414	25.00
September	5,243,069	1,723,956.54	917,947	9,300.00
October	3,922,427	1,317,681.92	214,143	2,160.00
November	4,669,625	1,523,176.49	.....	.....
December	6,714,599	2,195,060.32	.....	.....
1903.				
January	3,752,157	1,534,221.50	525	53.00
February	4,572,117	1,345,832.56	.....	.....
March	5,360,181	2,045,049.95	1,680,266	587,794.40
April	4,626,100	1,438,635.07	.....	.....
May	1,463,923	683,307.68	.....	.....
June	6,712,594	2,128,653.71	2,042,757	661,811.67
Total	54,660,749	18,353,943.15	4,911,305	1,261,249.27

Year.	Copper exports.	Value.
	Tons.	
1902–3	54,660	$18,353,943
1901–2	40,312	12,466,434
Increase	14,348	5,887,496

The exports of other mineral products in 1902–3 compared with 1901–2 were:

	Value.	
	1902-3.	1901-2.
Lead, 98,942 tons	$6,668,228.00	$5,722,045.59
Lead ores	2,909.95	
Antimony	823,995.00	
Antimony ores	315,118.00	354,281.59
Asphalt and coal	35,127.00	19,041.70
Marbles	150,646.00	98,550.00
Total	6,996,023.95	6,193,918.88

To the foregoing must be added the value of small lots of mineral products exported during the fiscal year 1902–3, which did not exceed $200,000.

MINING METHODS.

There are five processes for the reduction of ore in use in México—the *patio*, *tonel*, *lixiviation*, *fuego*, and *pan*, the *patio* and *lixiviation* being those most in vogue.

Patio process.—The *patio* process, invented, as before stated, by Bartolomé de Medina, consists of amalgamation with quicksilver. This system of treating ore is as follows:

The ore is brought from the mine in large pieces and carried to a covered box, where it is pounded to pieces by immense wooden crushers, provided at the end with heavy iron pestles, and working on arms connected with an axle, operated by horsepower. The iron pestles reduce the ore to pieces, which fall upon a sieve made of hide, the smaller fragments passing through it, while the larger are placed back in the box to be crushed again. There are generally several of these crushers in a straight line, working alternately. After the ore has been crushed in the mortars (*morteros*) it passes to the mill (*tahonas*), which consists of a round vat placed on a level with the floor. Here the ore is ground up into fine dust by means of three heavy and hard granite stones, oblong in shape and connected with a revolving shaft operated by horsepower.

By the gradual addition of water during this process of pulverization a muddy mass is formed, which at the proper time is thrown out into the *patio* (yard), which has a floor made of hard cement or stone where the mud is treated by the addition of quicksilver and strong brine called *caldo*. It is thus left in the open air, exposed to the heat of the sun, for some twenty or thirty days, being stirred every day by men and horses tramping over it until the quicksilver and the salt are well incorporated to the ore. This substance is called *torta de lama* (cake of mud), and when the process of mixing is completed the mud is carried to the *lavadero* (washing place) and placed in vats, where it is

LORETO SMELTING PLANT, PACHUCA DISTRICT, STATE OF HIDALGO.

washed, leaving in the vats what is called *plata piña* (amalgamated silver), containing quicksilver. This amalgam is then placed into stout canvas bags and submitted to a heavy pressure to extract the mercury, and when this operation is completed it is placed in the oven, where the silver is purified.

An additional process connected with this system in the reduction of certain kinds of ores is employed after the mineral has been exposed to the sun in the *patio*, or yard, when it is transferred to the *planillo*, which is an inclined plane in the open air, having a solid stone floor some 60 feet long and 20 feet wide. The workmen are engaged all along this inclined plane in throwing small quantities of water on the *lama*, so that the mud runs off to a ditch, while the silver remains at the foot of the plane. This method requires skill, as the water must be added gradually. The silver and the remaining muddy mass is carried to a large iron boiler where it is heated and stirred until the evaporation of the liquid is accomplished. At the proper stage of this operation the remaining substance is taken to the amalgamating room, where the quicksilver is added, which unites with the silver. The mass resulting is then washed again, only the amalgam of silver and mercury remaining, which is further purified in a furnace and the silver run into molds.

Lixiviation process.—In the method of lixiviation, which is adopted in several of the States, the rock is crushed dry and passed through screens of twenty to thirty meshes to the inch. It is then roasted in reverberatory furnaces with salt. The roasted ore is then subjected to the water process, being kept in large tanks or tubs, constantly covered and run over by clear water during a number of hours, after which the water is drawn off and a cold solution of hyposulphate of soda is made to pass through the ore until it is ascertained that the solution carries no more silver. The silver carried by the hyposulphate solution is precipitated by the addition to that solution of another solution of quicklime and sulphur, known as calcium sulphide, which is made by boiling lime and sulphur. After the precipitation and the running off of the precipitating liquid the silver appears as a sulphide, is put into canvas filters, dried, roasted in reverberatory furnaces to carry off the sulphur, and then melted into bars. If the operation is carefully performed the bullion resulting will be from 900 to 1,000 fine. The solution is pumped back into the tanks to be used again.

Silver ores.—There are several kinds of silver ore taken from the mines. Some of the principal varieties are *plata blanca* (white silver), which is the rarest and best; *plata verde* (green silver), united with copper; *bronces* (bronzes), united with iron; *plomosos* (lead), united with lead, a very soft ore; *caliches* (chalk), united with a chalky substance very greatly resembling the common white limestone, but which is rich in silver and easily worked. Previous to the passage of the

tariff bill of 1890, generally known as the McKinley bill, and the succeeding tariff bills, silver-bearing lead ore was brought from México to the United States for reduction. These bills put a heavy duty on such ores, and have caused companies to form in the latter country to establish smelting works in different parts of México. Millions of dollars have been invested by American capitalists in this industry.

Wages for miners.—Wages for miners range all the way from 37½ cents to $1.50 per day, the workmen being mostly *peones* (day laborers). Superintendents, ore treaters, etc., are generally Americans, Swedes, or Germans.

MINING DEVELOPMENT.

President Díaz in his message to Congress September 16, 1903, refers to the development of mining in the following language:

"Mining continues to progress, in spite of the depreciation and fluctuation in the price of silver, which is mining's chief product. During the last fiscal year 4,132 title deeds to mining properties were issued, embracing an area of 61,396 hectares, which is an increase of 524 title deeds and 736 hectares as compared with the previous year.

"In the period that has elapsed since my last message three contracts have been entered into for the exploitation of all kinds of minerals in Jalisco, Lower California, and Zacatecas, and another for the establishment of reduction works, while the contract for the exploitation of sulphur in the mining camp of Cerritos was amended.

"The exploitation of ores, other than those containing gold, silver, lead, copper, and iron, is being undertaken, for recently various title deeds have been issued for mines of cobalt, nickel, tin, bismuth, and principally antimony. Of the latter metal alone 5,351 tons of ore, yielding 2,150 tons of antimony, were treated in the Wadley smelter at San Luis Potosí alone."

Consul-General Barlow, in his report of October 29, 1902,[a] referring to the amount of American capital invested in México, says the following, relating to mining:

"Next in importance to the railroads, from the standpoint of American capital invested, is the mining industry. Since the time of Cortés mining has been the principal source of México's wealth. The amount invested by Americans in mining in México may be stated, in round figures, at $80,000,000.

"This is a comparatively small percentage of the total amount of capital invested in Mexican mining properties, yet a large amount of this $80,000,000 is invested in up-to-date mining machinery, which is competently handled; and México's mineral wealth has been greatly increased by this American investment. Mines that were given up years ago and mines that could not be worked at all on account of the

[a] "United States enterprises in México," Commercial Relations of the United States, 1902, Vol. I, p. 433.

low grade of the ores can now be profitably worked by the newer methods, for which México is mostly indebted to Americans. The increased output of Mexican mines, as well as the opening up of new mining districts, is largely due to Americans, both through the improved mining methods and through the development of the country by railroads built by our capital. Thus, taken on the whole, American capital is a stronger factor in México's principal industry than the amount invested indicates on the surface.

"From the analysis it is seen that Sonora has the largest amount of capital invested in any one State of México—$27,800,000. For the purpose of these comparisons, a rough estimate is made of the value of the capital in cases where it is left blank in the tables. From data obtainable this general statement may be held to be reliable.

"Chihuahua comes next, with $21,000,000. The amount—$6,000,000—credited to the Federal District does not represent the amount invested within the Federal District, for that is practically nothing, but represents the capital invested in all parts of the Republic by various mining companies having main offices in the City of México. Therefore the State of Durango ranks third in importance with regard to the amount of American capital invested in its mining industry, with $6,500,000. Coahuila is next, with an even $6,000,000 of American capital invested."

The number of American firms engaged in mining, according to the same report, is 290. All the States are represented, the principal, as regards the number of firms, being Sonora 62, Chihuahua 45, Sinaloa 30, Federal District 24, Durango 23, Oaxaca 17, Jalisco 16, Nuevo León and Zacatecas 11 each.

COAL, PETROLEUM, ETC.

Mexican geologists affirmed for many years that no mineral coal existed in their country. About the year 1881, however, reports from several parts of the country claimed that anthracite coal had been discovered, and many specimens of what was supposed to be this mineral were sent to the National College of Engineers to be assayed. Much enthusiasm was aroused by these reports, and the Department of Promotion appointed scientific commissions to visit the alleged coal localities and report thereon. The labors of these commissions proved that coal did exist, assaying from 41 to 92 per cent, the latter in the State of Sonora. It was to this coal that General Rosecrans gave the name of black gold. The commissions discovered and reported on anthracite deposits in Sonora, Michoacán, Veracruz, Guerrero, Oaxaca, Puebla, and other States.

The excitement and enthusiasm thus created led to the formation of many coal companies, and many persons looked forward to the amassing of fortunes out of collieries, but the results were not great. This

enthusiasm was succeeded by a state of depression and inactivity by the discovery that the seams of coal brought to light were poor, and that the reports and rumors were exaggerated. Want of means of communication between the deposits and the markets also had much to do with the quiescent state. The depression continued until profitable coal deposits were unearthed in Coahuila. These deposits occur, geologically speaking, in the Cretaceous formation, and are divided into two beds, the Upper and the Lower. The product of these fields has been used to supply coke for the use of smelters in several Mexican States, and some coal has been shipped to the United States through the port of Piedras Negras. Throughout this region the coal measures are considerably disturbed by faults and foldings, and the seams are irregular in width, having many barren areas between them.

Along the Gulf of California, extending north to the Arizona line, in the State of Sonora, coal was found and used by local silver smelters as early as the year 1870. In 1890 an English company secured a concession of 4,000,000 acres of land in this belt. Through failure to carry out the terms of the concession it was forfeited, and a Mexican company was organized to carry on the proposed work, but has done little of importance.

The coal is anthracite and semianthracite, containing from 8 to 15 per cent ash and sulphur, according to reported analyses.

Up to 1890 some 59 coal mines had been opened up in the State of Puebla, but poor facilities for transportation, difficulties encountered in mining, and the rather poor quality of the coal conspired to prevent great activity being shown, despite the desire of the State government to foster and advance the industry.

It is reported that during the fall of 1897 fairly good coal fields had been discovered near Colombia, State of Nuevo León, and that they were to be worked, a concession having been already requested to build a short railway line to the fields.

According to Mexican official publications there are in the State of Oaxaca several known deposits of coal, which is also to be found in the States of Veracruz, Puebla, Hidalgo, Michoacán, Tlaxcala, Sonora, Tamaulipas, Chihuahua, Morelos, Querétaro, Jalisco, and Coahuila. Peat is found in Sonora, Tamaulipas, Veracruz, Puebla, and elsewhere. It abounds on the banks of the Tololotlán River near Lake Chapala, and in the valley of México. Lignite, or brown coal, is found in Puebla, Tlaxcala, Veracruz, Hidalgo, Chihuahua, Guerrero, Morelos, Querétaro, Jalisco, and Coahuila.

Petroleum and asphaltum.—The territory of México abounds in deposits of asphaltum and liquid petroleum. These deposits have not been, until recently, worked to any great extent.

The entire Atlantic coast of the country shows traces of oil and asphaltum, which there goes by the name of *chapapote*. In the north-

ern part of the Republic, between the foothills and the coast, there exist springs and deposits of the substances named.

The deposits of asphaltum in the vicinity of Túxpam and Tampico are excellent in quality, and from them the merchants of the coast have shipped, at various times, small quantities to the United States and Europe. This asphalt may be easily broken into blocks and floated down the river to the seacoast, where it may be collected and laden on ships. At Huasteca and on Lake Chapala, as well as on the Champayán Lagoon in Tamaulipas, asphalt is to be found.

Crude petroleum springs running freely are to be found on the banks of several rivers, the oil flowing into these and covering their surface for some distance. Samples of this oil have been assayed in Pennsylvania, and are reported to be of a quality equal to the crude product of that State. Late in 1896 the United States consul at Matamoros reported to the Department of State[a] the discovery, about 300 miles from his post, of "the richest asphalt field known," where there were "about 20 wells which have a continuous flow of mineral tar, as the analysis (made at the University of Texas) call it. The ground for over 20 miles square is covered with asphalt deposits. The nearby streams have the whole year round a fatty, oily substance flowing into them from the surrounding mountains, making the water unfit to drink. From all indications there must be a large deposit of petroleum and coal under this asphalt field."

Mineral oils and petroleum have been found in many other localities, principally in the Villa de Guadalupe Hidalgo, Lake Chapala, Puerto Angel, and Pochutla, in the State of Oaxaca; in Otzumatlán, Michoacán, and in several other places.

Under date of June 15, 1898, a concession was granted to a London firm by the Mexican Government for the establishment of the industry of petroleum extraction, according to the provisions of which the said grant was to hold for a period of ten years.

Petroleum seems to have been found in Tehuantepec. The deposit is situated about midway on the line of the railway from Coatzacoalcos to Salina Cruz. The owners of the land have opened a provisional well for the purpose of collecting as large a quantity of the oil as possible, and called an expert to analyze the product. His report was favorable, and the owners of the land have ordered the necessary machinery for the purpose of beginning the extraction and refining of the petroleum as soon as possible.

New mines and mineral deposits are being constantly found in all of the mining sections of the country.

MINING LEGISLATION.

Mining legislation in México has been undergoing a logical and radical evolution since 1884. In the colonial period from 1521 to 1821

[a] United States Consular Reports, Vol. LII, p. 619.

the primitive mining legislation of New Spain consisted of several isolated rulings. One of the most remarkable was that issued by Charles II, and later confirmed by Phillip II, establishing the equality of rights between the natives and the Spaniards. During the eleven years of the war of independence, terminating in 1821, the mining industry was partially paralyzed. When national autonomy was finally established all minerals were declared to belong to the nation, but the ancient rulings continued in force with all their inconveniences, taxes were increased, and consequently mining developed on even a smaller scale than in the colonial period. When the Federal Republic was established in 1857 the definite political constitution was formed, and according to it each State could legislate in regard to mining freely and independently of each other. This state of affairs was discouraging and consequently the working of the mines ceased to a great extent.

A few years prior to 1884 the country began to experience trouble through the fall of silver, and on December 15, 1883, Congress authorized the Executive to issue a mining code for the Republic. This code was promulgated in 1884, and although it was based upon the principle of the former rulings, still it gave greater freedom to the working of the mines. In 1887 the mining industry felt the effect of the monetary situation above referred to and the law of June 6 of that year was enacted, exempting iron, quicksilver, and coal mines from taxation, certain necessary articles were relieved of import duties, and the Executive was authorized to execute special contracts. The monetary crisis having become acute, the law of June 4, 1892, was enacted with a view of facilitating the working and increasing and cheapening the production of the silver mines. This law is still in force.

The following table shows the relative exportation and production of ores, bullion, and Mexican coin during the several periods:

Legislation of the States (from 1880–81 to 1884–85)	$126,771,390
Mining code, 1884 (1885 to 1889–90)	167,993,780
Law of 1892 in force (1893 to 1901–2)	556,992,617

Mining law.—The mining law now in force in México was promulgated on June 4, 1892. Its leading provisions are as follows:

A concession is required for working the mineral substances here enumerated: Gold, platinum, silver, quicksilver, iron (except marsh ores, loose surface ores, and ochers worked as coloring matter), lead, copper, tin (except float tin), zinc, antimony, nickel, cobalt, manganese, bismuth, and arsenic, either in their native state or mineralized. Also precious stones, rock salt, and sulphur.

Combustible minerals, mineral oils and waters, rocks on the land, either separately or as building or ornamental materials; earths, sand, and clays of all kinds, and mineral substances not elsewhere specified

may be freely worked by the owner of the ground where they exist without a special concession in any case. Surface or subterranean excavations that the working of any of these substances may require are subject to the regulations relating to the order and safety of mines.

Payment of the Federal property tax, prescribed by the law relating thereto, will convey the fee title to all mining property legally acquired under this law. Mining property, except in the case of placers or surface deposits, is understood to refer solely to the underground work and not to the surface, which remains under the jurisdiction of its owner, save such parts thereof as may de needed by the miner, relating to which the law makes sundry provisions.

A mine can not be worked beyond its prescribed boundaries, save when the adjacent ground is unoccupied, and then only conformably to the regulations and after petitioning for an enlargement of the concession. In order to occupy another's land his permission is indispensably necessary, except in the case of easements.

Water brought to the surface by reason of underground work shall belong to the mine owner; but the general provisions of law must be observed with respect to the rights of the owners of the land over which the same may flow.

Mining operations being deemed of public utility, in case of failure to agree condemnation proceedings may be resorted to for the acquirement of the necessary ground.

Should efforts on the part of mine concessionaires to make arrangements with landowners looking to the occupancy of the necessary portion of ground to conduct the working of placers or surface deposits or to construct buildings and other mine appurtenances fail, condemnation proceedings must be instituted before the local court of the first instance, where the proceedings shall be as follows:

Each party shall name an appraiser, who shall, within eight days, reckoned from the date of appointment, present his respective report. In case of disagreement the court shall appoint an umpire, who shall also file his report within eight days after his appointment. Within the next ensuing eight days the court, after considering the opinions of the appraisers and the evidence submitted by the parties, shall determine the extent of ground to be occupied and the amount of indemnity to be paid. From this decision no appeal lies.

Should the owner of the land fail to name his appraiser within eight days after notice from the court, the latter shall on its own motion, appoint one to represent the owner's interests.

Should the ownership of the property to be occupied be uncertain or doubtful, the court shall set as the amount of indemnity such sum as may be agreed upon by the appraiser appointed by the grantee of the mine and the one designated by the court to represent the legal

owner, the sum being deposited to be delivered to the party entitled thereto.

The appraisers shall base their valuations upon the value of the land, the injuries immediately accruing to it, and the easements attachable thereto.

Mining properties and adjoining lands shall enjoy and suffer, as the case may be, the easements of way, water rights, drainage, and ventilation, the courts being guided in the matter of adjudication and indemnity by the *lex loci*, where the same does not conflict with the rules which are laid down in this law.

Every inhabitant of the Republic may freely explore the national territory for the purpose of discovering mineral deposits, but should excavations be made in lieu of borings, the former shall not exceed 10 meters in length or depth. No permit is necessary, but previous notice must be given to the proper authority.

No prospecting may be done on private property without leave of the owner or his representative. In case permission is not obtainable, it may be asked of the proper executive officer, who may grant the same pursuant to the regulations, bond being previously furnished by the prospector to answer for all damages, such bond to be to the satisfaction of the officer after hearing the owner of the land or his representative.

No prospecting may be carried on within private buildings or their appurtenances except by leave of the owner; neither shall mining explorations be conducted within the limits of towns or cities, nor within or in the neighborhood of public buildings and fortifications.

The unit of concession, or mining claim, shall hereafter consist of a prismatic body of indefinite depth, forming on the surface a horizontal square having sides 100 meters in length, and bounded below the surface by the four corresponding vertical planes.

The mining claim is indivisible in all contracts affecting mining grants or ownership thereof.

Unless the original prospector shall petition therefor within three months, mining grants shall be made to the first applicant and shall embrace, wherever there is sufficient unoccupied ground, the number of claims petitioned by the interested party, who should always clearly specify, in accordance with the regulations, the actual location of the claims constituting his grant.

Should a space less than the unit of concession lie between the newly granted claims and others previously conveyed, such space shall also be granted in fee to the first applicant.

Applications for mining grants should be filed with the special agents appointed in the States, Territories, and Federal District by the Department of Promotion. These agents are authorized to collect the fees prescribed in the Department schedule.

The agents shall receive the applications, immediately recording the day and hour of filing. They shall then publish the application, cause the claims to be surveyed by the engineer or expert by them designated, and should no objection be filed, they shall forward a copy of the record and plan to the Department of Promotion for approval and issuance of the patent.

The record having been approved and the patent issued, the grantee enters at once upon the mining claims without further formality.

The agents are prohibited from suspending the record in its regular course for any reason whatever, except in the event of objection; and the periods established by the regulations having expired, they are bound to transmit at once a copy of the record, in whatever stage it may be, to the department, so that, after examination, it may dismiss the application for want of diligence should it so find, or hold the agent responsible should the delay be attributable to him. Negligent applicants can not twice solicit the same grant.

Should objection to the granting of an application or to the proper surveys be filed by the owner of the land, alleging the nonexistence of the deposit, the agent shall dismiss the objection should there be any indications of a deposit on the land or any boring or prospecting work on said deposit.

In case no such indications, borings, or works exist, proceedings similar to those hereinbefore mentioned shall be instituted, the court deciding whether or not the grant shall be made, his decision being appealable in either case. The judgment is to be communicated to the Department of Promotion.

The agents shall suspend proceedings in case an objection is filed, and forward the record to the local court of the first instance for the institution of the proper judicial inquiry. The court shall make known its decision to the Department of Promotion.

Working of mineral substances, either conveyable pursuant to this law or belonging to the owner of the surface ground, is subject to the regulations; but, by observing these, mine owners shall be allowed full liberty of action to work as may seem best to them, pushing, delaying, or suspending for a greater or less time their work, employing therein the number of laborers they may see fit and wherever may best serve their purpose. Mine owners, however, shall be liable for accidents that may occur in the mines due to poor workmanship, and to indemnify the damages occasioned other property through lack of drainage or through any other cause affecting the interests of others.

When, in order to push the works of a mine in any locality, drainage tunnels may become necessary, the execution of such works shall be the subject of contract between the parties interested.

Associations or companies formed to operate mines shall be governed by the commercial code.

The contract for advances (*de avío*), so called, up to this time, shall hereafter be considered either as a partnership—in which case it shall be governed by the commercial code—or a mortgage. A mining mortgage may be freely constituted in accordance with the civil code of the Federal District, bearing in mind the indivisibility of the claim hereinbefore mentioned, and, as regards recording, observing the provisions of the commercial code, to which end a special book shall be kept for mining operations. The mortgagee shall always have the right to pay the Federal tax hereinbefore mentioned, and shall thereby acquire a preferred right with respect to the owner of the mine and his own mortgage.

Mortgages may be divided into bonds, assignable or payable to bearer, either by the terms of the original mortgage deed or by subsequent instrument. In every case it shall contain provisions constituting a common representative of the bondholders. These provisions, as well as those relating to the aggregate of the debt, the conditions thereof, and of the security, shall be printed in the bonds.

Bondholders may only proceed against the mortgagor or the mortgaged property through the common representative, whose acts with respect to said right shall be binding on all.

Failure to pay the property tax, pursuant to the provisions of and procedure under the law establishing the same, shall be, from and after the date hereof, the sole cause for forfeiture of mining property, which property so forfeited shall be free of all burdens and may be granted to the first applicant.

All matters relative to the establishment and working of smelting and reduction works and assay offices shall be governed by the general laws, and in so far as regards taxation by the law of June 6, 1887.

Parts of tunnels located outside of claims, when intended solely for ventilation, drainage, and extraction of metals not taken from the said tunnels, are exempted from taxation.

Denouncements of mines or surplus ground in the course of adjudication when this law goes into effect shall be decided in accordance therewith.

Surplus ground and vacant spaces between adjoining or abutting mining properties not denounced when this law goes into effect shall belong and be granted to the first applicant.

The law went into effect on the 1st of July, 1892.

MINING TAXES.

On June 6, 1892, the President promulgated, through the Finance Department, a mining-tax law, the principal provisions of which are as follows:

Pursuant to the new mining law, a Federal mining-property tax is

SAN RAFAEL MINING WORKS, PACHUCA DISTRICT, STATE OF HIDALGO.

established. It is dual in its application—one to be paid but once in stamps to be affixed to every title or patent, and the other to be paid annually for each claim which a grant covers. Every fraction of a claim exceeding the half of a full claim shall pay the same as the latter. Smaller fractions are exempt.

The stamps shall be of the denomination of $10, and are to be affixed to the title or patent at the rate of one stamp for every claim of 10,000 square meters. Fractions are to be paid for as above.

Every mine owner or occupant is bound to pay the sum of $10 per year for every claim composing his grant.

This annual tax is to be paid quarterly in advance, payment to be made during the first month of the quarter, without notice.

Any concealment of the number of claims owned shall be punished with a fine in double the amount of the stamps the patent or title should bear for the claim concealed; and further, a fine in double the amount of the annual tax for the whole if it shall not have been paid, without prejudice to civil and criminal liability.

Default in the payment of the annual tax within the first month of the quarter will subject the mine owner to a fine equal to 50 per cent of the tax, if paid during the second month. Should payment be deferred until the third month, the fine shall be equal to the full amount of the tax. Upon the expiration of this term without payment of the tax and accumulated fines the mine is forfeited without appeal.

Upon the sale of a mine the grantor shall give notice of the same for record, and the deed shall have affixed the stamps required by the law.

In case any person or company shall find it inadvisable to continue the working of a mine or mines, notice must be sent to the proper office of the Treasury Department in order to settle the tax up to the date of notice and make the necessary entry in the record.

On July 1, 1897, another mining-tax law went into effect. Its provisions are as follows:

ART. 1. Silver and gold are subject, in accordance with the provisions of this law, to the payment of the following taxes and charges:

I. Interior stamp tax, at the rate of 3 per cent on the value of said metals.

II. Coinage charges, at the rate of 2 per cent on the value of the same metals.

III. Assaying charges, in conformity with the tariff which the Department of the Treasury may publish.

IV. Charges for smelting, refining, and separating in accordance with the respective tariffs which may be published by the same Department.

ART. 2. In order to liquidate the stamp tax and coinage charges, the basis for estimating the value of the precious metals shall be the value which the monetary laws of the country assign to the said metals, i. e.,

the kilogram of silver being at present $40.915 and the kilogram of gold $675.416.

ART. 3. The cost of the respective operations will be taken into account in connection with the tariff which clauses III and IV of article 1 establish for the collection of the charges.

ART. 4. Not merely gold and silver in mixed bars, or consisting of one of these metals, but also sulphides of silver, argentiferous copper and lead, mineral in a natural state, or concentrated, or which may have been to a certain extent treated, and generally any other ore or substance which contains silver or gold, are subject to the payment of the taxes and charges established by article 1.

ART. 5. The stamp tax and coinage and assay charges shall be paid in all cases, whether it be that the substance is presented for coinage or for exportation. The smelting charge shall only be collected on the substances which are not homogeneous and therefore require to be smelted in order to effect the assay valuation and liquidation of same; and the charges for refining and separating shall only apply to the substances intended for coinage.

Foreign money is not liable to the burdens imposed by this law, but it shall be subject when introduced to a mint—for purposes of recoinage—to the payment of the coinage charges, and also in proper cases to the charges established in sections III and IV of said article.

ART. 6. The payment of the respective taxes and charges shall be made at the mints or in the special assaying offices, whether the metals be introduced for coinage or for the purpose of exportation, and in each case the requisites established by the regulations must be complied with.

The taxpayers who can not prove that they have paid the taxes in the establishments mentioned, and who may wish to ship gold or silver, or any substance which contains these metals, to a foreign country, shall be allowed to make the payment at the custom-houses upon the terms and requirements of the said Regulations.

ART. 7. The payment shall be made in current money of Mexican coinage, but as regards the stamp tax the collecting offices shall affix to and cancel on the respective documents which they shall deliver to the taxpayers the corresponding stamp for the amount of said tax. These documents shall be made out in the form which the regulations shall provide, specifying the value of the metal and the amount of the tax and charges.

ART. 8. When the minerals destined for a foreign country come from any State in which they have been taxed in conformity with the law of the 6th June, 1887, the coinage charges and stamp tax may be liquidated, taking as a basis—always provided that the Department of the Treasury has so authorized—the value which has been given to the minerals in the assaying office or in that of the collector of taxes.

ART. 9. The metallurgical establishments, which by express stipulation in force at the date of this law enjoy the privilege, shall continue to enjoy the privilege of exemption from the payment of the coinage tax upon the silver which they may export direct, provided always that the proportion of silver in the argentiferous leads does not exceed seven one-thousandths and that of the argentiferous copper twenty one-thousandths; but if the proportion of silver exceeds these limits, the said establishments shall pay the coinage tax upon the excess. This exemption applies only to those products which originally proceed from the establishments enjoying the franchise, and not to those products purchased from other concerns.

ART. 10. The coinage and stamp tax on gold, according to the law, shall be estimated upon the intrinsic value of the precious metal contained in the minerals which are exported, with only such exceptions as are contained in the following articles.

ART. 11. The mineral substances which contain less than 250 grams of silver or 10 grams of gold per ton are exempted from the payment of the tax and charges imposed by this law, the proportion between the one and the other limit to be taken into account in case of a combination of both metals.

ART. 12. The mineral substances of gold or of silver which may be exported in their natural state, or after mechanical concentration, shall be liable to the coinage charge and also the stamp tax upon the gold and silver which they contain, 10 per cent being deducted.

ART. 13. Should the Department of the Treasury see proper it may grant special concessions to the concerns which are in the habit of exporting ores in large quantities, provided that such concerns satisfactorily prove by means of their books and other documents the weight and proportion of metal of the ores which they wish to export, and that they admit, for this purpose, the unconditional investigation of the Treasury agents. This concession may be extended to arranging with the exporters for the payment of a fixed sum as remuneration of the Government for the cost of the assay and inspection of said mineral substances; but in no case shall it allow of an exemption from or rebate on the stamp tax and coinage charges established by this law.

ART. 14. The Regulations shall fix the penalties which violators of this law shall incur and the mode of making the same effective, placing clandestine exportation on a level with contraband, and punishing it with the penalties which for this offense are imposed by the general custom-house ordinances and other relative laws.

ART. 15. The producers of silver which contains gold are at liberty to separate the same in their own private establishments; and in case that they introduce silver mixed (with other metal) to any Federal Government office, they shall have the right to separate the gold to the extent that they may desire, paying the respective tax or charge per

kilogram, in accordance with the tariff. If the producers do not fix the extent, the separation shall be made on their account, when the proportion of gold is equal to or greater than two one-thousandths.

ART. 16. The rates fixed in the general stamp law for the "accounts" issued by the mints and for the "metals of gold and silver" are repealed; the laws and provisions at present existing with reference to the Federal taxes and charges on gold and silver are also repealed.

The States can continue collecting the local taxes authorized by the law of the 6th June, 1887, which shall be liable to the Federal contribution mentioned in the stamp law.

The total product of mining taxes and other dues for the fiscal year 1901–2, amounted to $3,847,375.26, as shown in the following figures from Mexican official sources:

Metals for coining:		
Mint (stamp, mint, and other dues)	$1,035,469.68	
Federal assay offices (stamp, mint, and other dues)	439,726.76	
		1,475,196.44
Metals for export:		
Mint charges	268,113.61	
Federal assay charges	1,270,151.97	
Custom dues	833,913.24	
		2,872,178.82

CHAPTER X.

INDUSTRIES AND MANUFACTURES.

México is not a manufacturing country. Such articles as the mass of the people require are, however, generally produced in sufficient quantities to meet the demand. She is, since the great depreciation of silver, beginning to learn that it is cheaper to make than to buy, and within the past three or four years very large amounts of capital have been invested in manufactories and industries. México will hardly become, for very many years at least, a manufacturer of articles beyond those of which she produces the raw materials; but this would furnish a field for the investment of almost limitless capital, for hardly any nation on earth furnishes raw materials in so great abundance. Manufactures will spring up with the increased production of raw materials, but the country's agricultural resources are so great it is destined to become, still more than at present, a great exporter of raw material. The natural products of the soil are so varied, so certain, and so sure of good markets, that capital is diverted to agricultural and mineral development rather than into manufacturing enterpises on a large scale.

The Indian, who forms the largest portion of the laboring population, is not progressive. He is loth to lay aside the rude implements of his forefathers and take up methods of modern invention and advancement. His needs are few, and he is not inspired with a desire to improve his condition. Having inherited nothing but tradition and the meager physical means to provide for his sustenance, he zealously guards the one and utilizes the other to the same extent as his forebears, leaving his children only what he himself received. The three centuries of Spanish domination have left their imprint upon his character, and everything he does is executed in a perfunctory manner. He goes to his daily toil early and returns to his frugal meal and rest late. Ambition within him is dead. He is satisfied with his lot and cares little what the morrow may bring forth. But the Indian is losing ground. The white races are surpassing him, and with increasing transportation facilities, a progressive government fostering industrial interests, the disappearance of internecine strife, the influx of foreign capital and enterprising men, his successors will, in the not very distant future, either join the ranks of the progressive people, as in the thickly

populated portions of the Republic they have already begun to do, or die off, to be replaced by a more energetic and ambitious class.

Time was when México was regarded by natives and foreigners as a land of mineral wealth only, and her many other natural resources were but little noticed or developed. The building of great railway systems, affording better means of communication, has, however, brought to the notice of the world at large the great possibilities for wealth earning which the country affords.

Brantz Mayer,[a] writing of México and a portion of the territory of that country which but a few years before had been annexed to the United States, said:

"California has at least illustrated one great moral truth which the avaricious world required to be taught. When men were starving, though weighed down with gold—when all the necessaries of life rose to twice, thrice, tenfold, and even fifty or a hundred times their value in the Atlantic States—that distant province demonstrated the intrinsic worthlessness of the coveted ore and the permanent value of everything produced by genuine industry and labor."

Spurred on to a recognition of this truth by exchange, which has acted as a protective tariff, the country, which knew practically nothing but mines, began, a few years since, to manufacture, and to-day the whistle of the mill and the sound of the hammer are beginning to be heard throughout the land. Many articles which five or six years ago brought the Government millions in duties are now not imported, the people having gone into the manufacture of these articles, which thus produce revenue to the Government through other channels at the same time that they add to the wealth of the people.

Cotton mills.—The principal manufacturing industry of the Republic is the making of cotton cloth, mostly *manta*, a coarse, unbleached cotton fabric. It has been estimated that the mills of the country consume annually about 40,000,000 pounds of cotton, quite a large portion of which is imported from the United States. The industry gives work and support in the field and mills to more than 80,000 families. As a rule the mills are provided with old-style machinery, but recently a number of them have set up American and English machinery of modern type. The ordinary cotton cloth (*manta*), which is about the only material for clothing used by two-thirds of the inhabitants of the country, is usually made up in pieces of 30 yards 4 inches in length by 34.12 inches in width. The price of the piece varies from $2.88 to $4.

In the year 1895–96 there were 100 cotton and print mills in the country; in 1897 they had increased to 111, and the development of this industry since then is shown in the following table:

[a] Mexico, Aztec, Spanish, and Republican, 1852.

Year.	Factories.		Spindles.		Looms.		Printing machines, modern.
	Working.	Idle.	Old style.	Modern.	Old style.	Modern.	
1898–99	112	6	274,959	194,588	8,992	5,052	27
1899–1900	134	10	273,219	315,255	8,427	9,642	36
1900–1901	134	19	188,364	408,452	6,987	11,746	33
1901–2	124	31	162,359	433,369	5,647	12,575	33

Year.	Cotton consumed.	Pieces woven or printed.	Yarn produced.	Sales declared.
	Kilos.		*Kilos.*	
1898–99	27,594,260	10,753,764	1,931,422	$29,926,568.18
1899–1900	28,985,254	11,525,952	1,884,401	35,458,577.78
1900–1901	30,262,319	11,581,523	1,873,302	33,877,214.87
1901–2	27,628,366	10,428,532	1,879,329	28,779,999.49

Industrial taxes paid by the 114 cotton mills in operation in the Republic for the half year from January to June, 1903, amounted in the aggregate to $812,399.70. The largest item is $149,543.90, assigned to the "Compañía Industrial de Orizaba," the principal cotton mills in México; then follow the "Compañía Industrial de San Antonio," with $43,455.20; the "Compañía Industrial Veracruzana," with $68,683.35; the "Compañia Industrial Manufacturera," with $35,000; the other mills vary from $16,000 downward.

The assessment for the six months mentioned exceeds that paid in the half year from July to December, 1902, by $2,886.60, and the number of mills assessed was 124, being 10 more than the number above quoted. The number of hands employed in the cotton factories of México in 1902 was 50,632.

The distribution of this industry, by States, was during the fiscal year 1901–2, as follows:

CENTRAL STATES.

State.	Factories.			Cotton consumed.	Pieces woven or printed.	Yarn.	Sales declared.	Spindles.	Looms.	Printing machines.	Number of hands employed.
	Working.	Idle.	Total.								
				Kilos.		*Kilos.*					
Distrito Federal	10	3	13	1,975,992	1,565,322	296,215	$3,165,417.95	71,484	1,714	20	3,624
Durango	8	2	10	1,214,619	288,011	59,878	991,999.85	30,680	1,322	....	1,956
Guanajuato	6	4	10	1,739,234	280,768	202,162	1,200,219.63	44,980	1,207	....	2,648
Hidalgo	1	3	4	226,999	46,798	98,071	217,931.08	9,072	312	....	393
México	7	2	9	1,499,145	630,364	181,093	1,875,675.79	79,260	2,646	3	3,478
Puebla	26	5	31	3,953,417	1,933,088	111,926	4,625,149.90	176,846	6,112	4	6,580
Querétaro	4	....	4	1,151,385	527,667	227,596	1,229,747.05	51,820	1,412	6	2,490
San Luis Potosí	1	1	2	189,798	46,938	9,246	148,976.61	10,240	300	....	500
Tlaxcala	10	....	10	2,081,586	892,939	50,810	2,064,734.98	81,596	2,633	8	3,255
Total	73	20	93	14,032,175	6,211,895	1,236,997	15,519,852.84	555,978	17,658	41	24,904

NORTHERN STATES.

Coahuila	11	....	11	2,214,582	595,585	28,982	$1,635,117.17	108,566	3,551	1	4,236
Chihuahua	3	1	4	539,984	128,957	655	624,157.44	15,228	590	....	873
Nuevo León	4	....	4	912,072	271,526	1,375	854,744.89	36,334	1,152	....	1,577
Sonora	1	....	1	212,032	49,214	....	264,996.16	5,588	190	....	336
Total	19	1	20	3,878,670	1,045,282	31,012	3,379,015.66	165,716	5,483	1	7,022

GULF STATES.

State.	Factories.			Cotton consumed.	Pieces woven or printed.	Yarn.	Sales declared.	Spindles.	Looms.	Printing machines.	Number of hands employed.
	Working.	Idle.	Total.								
				Kilos.		*Kilos.*					
Veracruz	10	2	12	5,513,967	2,036,633	260,386	$7,016,054.59	233,198	7,168	26	10,022

PACIFIC STATES.

Colima	2	1	3	62,463	3,574	23,902	$39,764.01	2,684	48	....	151
Chiapas	1	....	1	102,744	34,900	.....	126,261.68	3,600	132	....	260
Guerrero	1	1	2	191,269	55,946	.....	98,913.49	5,196	202	....	324
Jalisco	4	4	8	1,451,045	395,576	140,774	614,261.30	87,836	2,258	2	3,114
Michoacán	4	1	5	772,365	175,240	154,408	491,359.88	25,808	692	....	1,458
Oaxaca	3	....	3	690,145	225,427	25,433	590,477.02	35,736	1,110	....	1,410
Sinaloa	4	....	4	265,809	71,486	6,385	326,107.32	11,504	478	....	787
Tepic (Territory)	3	1	4	667,714	172,573	32	577,931.70	24,352	718	....	1,180
Total	22	8	30	4,203,554	1,134,722	350,934	2,865,076.40	196,716	5,638	2	8,684

Besides the cotton cloth and prints, a considerable amount of cotton yarn is used in the manufacture of *rebozos* (an article serving as a shawl and scarf for women), blankets, and coarse napkins. The best *rebozos* are made in the town of Tenancingo. The articles named are also manufactured of silk and linen. There are in the City of México several factories devoted to the manufacture, by hand, of *zarapes*, *rebozos*, *mantas*, and other cotton stuffs.

The manufacture of knit goods, such as hosiery, underwear, etc., has increased considerably, and has resulted in making a very noticeable reduction in the amount of imported goods of this character. The cloth made is of a fair quality, and sells at from $1.62 to $2.62 per vara;[a] carpets being from $1 to $1.30 per vara.

As demonstrative of the profits to be made in the manufacture of cotton textiles, it has been stated upon good authority that one of the large corporations in Orizaba paid its shareholders in the year 1896 16 per cent. In the Federal District another company divided, during the same year, among its shareholders a profit of 15 per cent. The thread factories and cotton goods manufactories owned by individuals are said to make annually between 30 and 40 per cent on their capital.

Woolen mills.—Mexican industry also produces woolen blankets and blankets of a mixture of wool and cotton, cassimeres, which, although they have not the body and fineness of texture of those of European manufacture, have, on the other hand, great resistance, and are cheap. The *zarapes* constitute, perhaps, the most profitable industry. These multicolored woolen cloaks or blankets are well made, those of Saltillo and San Miguel being celebrated for their fine texture, brilliant colors, good finish, and excellent wearing qualities. They have achieved con-

[a] A vara is 34.12 inches.

RÍO BLANCO COTTON MILLS, ORIZABA, STATE OF VERACRUZ.

siderable fame abroad, and some grades have been sold for more than $100 each.

The principal woolen mills are in Aguascalientes, Durango, Guanajuato, Hidalgo, and Puebla. San Luis Potosí, Zacatecas, México, and Nuevo León also have woolen mills which produce a fair quality of goods.

It is not generally known that wool spinning has been going on in México for more than three centuries, yet such is the well-authenticated fact. In the year 1541 the first viceroy introduced Merino sheep into the country and established manufactories of woolen cloth.

Silk industry.—Silk weaving can hardly be said to be a great industry at present, but it is increasing rapidly. Silk was cultivated and sold in the markets of México as far back as the time of Charles V, Cortés speaking of the fact in his letters to that monarch, and there are still preserved pictures done by the ancient Mexicans upon a paper made of silk. The culture of the silkworm and weaving of its product were prohibited by the Spanish Crown in its American possessions during the vice-regal administrations as stated elsewhere. The industry gradually died out, and it is only of late years that it has been revived.

The climate of México is unexcelled by any in the world for the raising and developing of cocoons. The silkworms at the present time are mostly raised in Oaxaca, in the State of the same name; Tetela, in the State of Puebla; Ixmiquiltam in Hidalgo, and in the States of Jalisco, Oaxaca, Tlaxcala, Michoacán, Querétaro, Veracruz, Chihuahua, and Zacatecas. The white and black mulberry leaves grow well in these States and in the Federal District. In 1886 there were four silk factories, which could be considered to be fairly well equipped. They had plants of machinery imported from France, and, although small, were in the hands of enterprising men, and it was thought at the time that these factories and others, which it was said would be established, would manufacture more silk than could be consumed by the people of México. Statistics do not show that the outcome of this undertaking has been as successful as was expected. Although several of the State governments in the year 1886, prior to that time, and since then, offered inducements to those persons who should devote themselves to the growing of mulberry trees and the establishment of silk factories, success does not seem to have attended any of the efforts in this line. There is now one silk factory in the City of México, which is pronounced to be producing a very fair grade of goods.

There is a colony devoted to the raising of silkworms.

Paper mills.—Considering the great quantity and variety of fibrous plants and other material for paper making with which México is endowed, and that this industry has been protected for many years by the tariff, it seems strange that throughout the entire territory there

are only a few paper mills, which manufacture comparatively little writing paper, but a considerable quantity of wrapping and printing paper, envelopes, etc. The oldest mill is that at Cocolapan, in Orizaba, which produces a straw and printing paper of a low grade.

Under date of June 3, 1899, the legislature of the State of México granted the joint stock company known as "El Progreso Industrial," engaged in the manufacture of paper from the "maguey" fiber, exemption from all State taxes and contributions for the term of ten years. The company's mills are situated in the districts of Tlalnepantla and Cuautitlán. About 1,600 men were engaged in erecting the buildings. The engines will be moved by hydraulic power of 1,500 horsepower. The mills will be able to produce in large quantities all kinds of paper, especially those of superior quality.

Sugar mills.—Save in the State of Morelos and some districts in the States of Puebla, Veracruz, Michoacán, and Jalisco, and the Territory of Lower California, the sugar industry is very backward. In most of the sugar mills the juice of the cane is extracted by wooden cylinders, and boiled down to the necessary consistency to form small tablets or cakes (called *panelas* or *piloncillos*) of a dark brown saccharine substance called *panocha*. Except in rare cases, the use of steam and modern machinery is unknown. That this is a profitable industry is shown by the fact that the sugar mills of Tenango, Santa Clara, and San Ignacio, in the State of Morelos, paid back to their owners the total of their investment within four years.

Spirits.—Distilleries are to be found all over the country, yet very few of them have modern plants. These distilleries are chiefly engaged in distilling the liquor *mescal*, which has been described in another part of this book. Another liquor made in México is distilled from the sugar cane and is called *aguardiente* (burning water). It is one of the strongest liquors known.

A very fair native wine and brandy are made of the grapes, but this industry is not a prominent one and does not supply the home demand.

Beer and pale ale of an excellent quality are produced.

Official figures for 1901–2 show that there were then in the country 1,969 establishments devoted to the manufacture of spirits, from sugar cane, maguey, grapes, grains, etc., which produced during that year 33,288,853 liters of spirits, the principal production being from the sugar cane, 20,474,474 liters; from the maguey, 9,133,755 liters, and 2,930,554 liters of grain spirits, besides 135,249 liters of various spirits. The number of stills in use amounted to 2,439, with a capacity of 1,335,589 liters.

Tobacco.—The tobacco-utilizing industry is extensive, nearly every town and hamlet having its cigarette factory. The largest manufactories of cigars and cigarettes are in the Federal District, Puebla, and Veracruz. Cigarettes are very cheap, 700 to 800 selling for a dollar.

Good brands of cigars may be purchased at from $35 to $80 per thousand, Mexican currency. This industry is a profitable one, as it has been stated that a cigarette manufacturing company started operations the 1st of January, 1894, with a nominal capital of $1,000,000, introducing the most perfect methods for the manufacture of that product. The first year the company paid dividends of 14 per cent, in the second 15 per cent, and 17 per cent in the year 1896. This result is the more notable, inasmuch as the company at the time of its formation into a corporation had placed its capital at double the value of that which the business really represented.

During the fiscal year 1901–2 the number of tobacco factories in the country was 701, consuming 7,049,220 kilograms of the raw product in the manufacture of cigars, cigarettes, snuff, and cut tobacco. No chewing tobacco is manufactured, according to statistics.

Flour mills.—Although there are many flour mills in the country they do not by any means supply the local demand. Nearly all these are supplied with millstones from France, and the machinery in the majority of them is not up to the standard. There are over 50 good merchant mills in México, ranging in flour-making capacity from 40 to 250 barrels a day. At least 150 smaller and crude establishments are scattered throughout the Republic. None of these mills, however, can be said to be properly equipped, all being in need of wheat washing and scouring plants.

Iron and steel.—Iron foundries are numerous, the excellent quality of the Mexican minerals and their abundance making it possible for them to turn out good work. In most of these foundries the work is limited to the manufacture of smaller agricultural implements and ordinary marketable iron, although some large pieces have been manufactured in the way of sugar-making machinery and other heavy work. There is little doubt that at no very distant day this industry will be exploited to a much larger extent than it is at present.

The Government maintains a large arsenal and gun foundry in the City of México, where arms and munitions of war have been produced which speak highly for the skill and dexterity of the operatives in the establishment. There is also a large type foundry located in the same city, which turns out excellent work.

The iron made is almost exclusively charcoal iron of very high grade, as many of the deposits run from 50 to 70 per cent iron and contain a very low percentage of phosphorus and silica. The limit to the supply is set not by the stores of ore, which are practically limitless, but by the supply of wood for charcoal.

Probably the chief disadvantage with which the iron industry in México has to contend at the present time is the lack of transportation facilities to the shipping point from those mines which are well supplied with timber and charcoal. There are plenty of iron mines in the

Republic which are favorably located in heavily wooded regions, but the expense of packing machinery on muleback to the furnaces and then transporting the product by the same method to the nearest railroad point counteracts the benefits of favoring legislation.

The cost of producing pig iron is set down as averaging, roughly, $9 gold and bars $20 gold to the ton. Prices for this product may be said to be about $30 gold per ton, $70 for bars, and $100 for castings.

It is well known that the Aztecs used iron implements before the coming of the Spaniard, and in the sixteenth century the famous Cerro del Mercado—a mountain 4,800 feet long, 1,100 feet wide, and 640 feet high, containing more than 300,000,000 tons of ore, of which 70 per cent is iron—was discovered.

An authority[a] states that the iron plants in operation are of limited capacity, being principally foundries, which turn out castings for mines, smelters, and haciendas, and machine shops, whose equipment for the most part is neither modern nor extensive. The largest and most important of the iron and steel plants in the north part of México now in operation, says the same authority, is that of the "Mexican National Iron and Steel Company," in the State of Durango, which was built some ten years ago, and is within a stone's throw of the Cerro del Mercado, estimated to be the largest continuous deposit of hematite ore upon the American continent and one of the most extensive known in the world. There is also in Durango a small foundry and machine shop, situated about 6 miles from the city, and run by water power. There is also a foundry in the city of Guadalajara, in the State of Jalisco. The same authority continues:

"These and sundry other plants scattered about the country all occupy places of minor importance in comparison with the modern steel works of large capacity which are now nearing completion in Monterey, in the State of Nuevo Leon. This may be regarded as the first works of primary importance established in México. The company which initiated this enterprise and has carried on the construction to the present nearly complete stage was organized, in 1900, under the title of "La Compañía Fundidora de Hierro y Acero de Monterey," with a capital of $10,000,000 Mexican silver. This capital is nearly all paid up and the principal stockholders are United States and Mexican capitalists. The blast-furnace house is 200 by 50 feet; blast-furnace casting house, 180 by 50 feet; blast-furnace blowing-engine house, 130 by 50 feet; blast-furnace boiler house, 135 by 50 feet; open-hearth building, 204 by 100 feet; mill building, 1,284 by 100 feet; mill-boiler building, 200 by 50 feet; rail-finishing building, 196 by 50 feet; foundry, 225 by 120 feet; power plant, 156 by 56 feet; forge building, 100 by 50 feet; storehouse building, 60 by 60 feet; oil house, 60 by 30 feet;

[a] John James Davis, in the "Iron Trade Review." March 19, 1903.

laboratory, 35 by 45 feet. All the latest labor-saving and patented devices applicable to iron and steel manufacture are embraced in the equipment of the various departments. The yearly capacity is given as 128,000 tons, as follows: Rails, 40,000 tons; beams and shapes, 40,000 tons; billets and bars, 10,000 tons; pig iron, 30,000 tons; castings, 8,000 tons. The blast furnace and some of the shops are already in operation. Workmen said to be experienced in this line of labor have been imported from nearly all the countries of Europe."

Of works projected only one of an ambitious character is reported. This is also a steel plant, whose proposed point of location is the town of Tepeyahualco, in the State of Puebla. According to the terms of a concession recently granted the plant is to be a complete one for the manufacture of rails, beams, columns, etc.

Hammock manufacture.—Figuring among the prominent industries of the Republic is hammock making. This is principally carried on in the State of Yucatán, where hammocks have been articles of use and barter from time immemorial, which fact has been demonstrated by the discovery in buried cities of hammock beams and hooks. Yucatán exports more hammocks than any other province in the world. These articles are made from the fiber of the *henequén*, and are woven entirely by hand with the aid of a very few primitive instruments. All that is necessary to make a hammock is a couple of straight poles and shuttles, a thin slat of *zapoli* wood, and a pile of *henequén* leaves. With these articles at hand a Yucatán native is prepared to accept contracts for hammocks by the piece, dozen, or hundred. The great hammock-making district, whence comes the best make and which produces more than all the other districts combined, is Texcoco. Almost the entire exportation of these articles is consumed by the New York market. The Indian women are those principally engaged in the industry.

Pottery works.—Pottery is classed as a third-rate manufacture of the country. It is carried on everywhere. The cities of Guadalajara, Zacatecas, Guanajuato, and Puebla may be said to be the centers of the industry. The pottery and crockery of the various localities or districts where manufactured has its peculiar distinctive features of quality, design, and color.

The Guadalajara ware is gray, as a rule soft baked, polished, and often very elaborately decorated in colors, gold, and silver. The Zacatecas ware is red, hard baked, glazed, and decorated rudely with splashes of underglaze color. The Guanajuato article is in dark brown or dark green, with ornamentation of figures, and with a soft, rich glaze. In Puebla a coarse porcelain with a thick tin glaze is manufactured. Very fine glazed tiles, multiformed and vari-colored, are made in this city, specimens of these ornamenting the exterior and interior of the churches, which abound in the city named and

other cities and towns of this historic State. In some parts of the Republic a curious iridescent ware is made which has a copper glaze.

The crockery for table use is generally heavy and in white and blue. In many places the Indians are adepts in the manufacture of earthenware, and the Mexicans generally are skillful in the making of wax, clay, and rag figures, which is one of their profitable industries. In Guadalajara, the capital of Jalisco, and Tepic, in the Territory of that name, vast numbers of clay images, well molded and painted, are made. Foreigners are amazed at the perfect accuracy displayed by the humble artists in reproducing costumes and portraits from life or photographs. The rapidity with which the modelers perform their task is wonderful. Some of the clay and wax work manufactured by the deft fingers of the natives has been deemed worthy to rank with works of sculpture. The specimens of Mexican handiwork in wax which adorn the numerous churches do the artists great honor. No city in the Republic of any pretension is without the vender of rag, baked clay, and wax images, crying his wares.

Pearl fishing.—Ever since Cortés placed his foot upon the soil of the New World pearl fishing has been carried on in the Gulf of California, which, in the early days, bore his name. The industry was pursued for many years in a desultory way, the only persons engaged in it being a few Indians, who dived for the shells without having apparatus or modern appliances for diving. The Government has granted an English company a concession which is practically a monopoly of the pearl fishing in the Gulf of California. This company has provided its divers with all the modern appliances, thus enabling them to reach greater depths than were possible under the old system.

In 1896 the value of the pearls collected in Lower California was only $300. Besides this, however, there were exported 5,000 tons of pearl shell valued at $1,250,000. The headquarters of the natives engaged in this industry is La Paz, one of the capitals of the Territory named. The business is, of course, one depending considerably upon chance, but the natives are very fond of it. The large majority of the shells contain no pearl and are what is known as seed pearls. The largest pearl ever found in the waters of the gulf was about three-fourths of an inch in diameter and was sold in Paris to the Emperor of Austria for the sum of $10,000. A number of black pearls have been found in these waters, and they bring very high prices. In 1902 fine pearls were exported to the value of $45,000.

Other products.—Sponges, mother-of-pearl, abalone, and other shells are also found and constitute, together with tortoise fishing, a considerable industry. The Government has been anxious for some years to develop these marine branches of industry and production, and will make liberal concessions to companies desirous of engaging in them.

In comparison to the returns, the capital necessary to exploit them is small.

The exportations of pearl shell for the year 1901–2 were 227,228 kilograms, valued at $67,700; other shells, $10,000.

Cotton-seed mills.—There are a number of cotton-seed oil mills in the Republic, the largest being located at Lerdo, Durango. Considerable American capital is invested in the enterprise. The mill was established in 1887, and has a capital of $1,000,000. Its capacity is 100 tons a day. The meal is shipped all over México and to Rotterdam and Hamburg. The oil is used in the manufacture of soap, which is another considerable industry. This company has since 1892 sold between 10,000,000 and 11,000,000 pounds of soap a year.

Hides and skins.—Another noteworthy industry is the collecting and exporting of hides and skins. México occupies the fourth rank among the nations of the earth in this particular branch.

In the year 1901–2 that country exported hides, skins, and leather to the value of $6,286,577 Mexican silver, as follows:

	Kilos.	Values.
Hides	5,831,110	$2,603,367
Sheepskins	763	258
Goatskins	2,657,703	3,283,983
Deerskins	321,517	291,189
Boar skins	16,444	8,627
Alligator skins	225,948	95,627
Other skins	7,388	3,516

The kid exported through the Matamoros custom-house is much esteemed for the manufacture of strong shoes, its dimensions and weight ranking high. This kid brings from 45 to 50 cents per pound. The Veracruz goatskins are more sought after and bring 2 cents more a pound, while those from Oaxaca are lighter and bring about 39 cents per pound. These kids are considered among the best in the world for women's and children's shoes.

Tanneries—Tanneries are to be found at many places, and a very fair leather is turned out. Mexicans are artists in leather work, and in the making of saddles they excel. Saddles manufactured in the country have sold for more than $800, being profusely ornamented with silver and finely stamped leather. The center of the leather-working industry is the city of León.

Glassware.—Glassware is manufactured to some extent, but not to that warranted by the abundance of the raw material suitable to glass making. The industry is almost limited to the making of window panes and ordinary bottles and goblets, at prices so high that the poor are almost denied their use.

Other industries.—There are but few manufactories of jewelry and trinkets in the country, notwithstanding the Mexican love of display

in this line. The importations of jewelry and trinkets is made from France, England, and the United States. The silver and gold smiths of the country excel in the execution of filigree work, it being sought after in all parts of the civilized world.

The manufacture of *acids and chemical compounds*, which would undoubtedly be a profitable industry, has about thirteen establishments devoted to it, and of these not more than five manufacture acids—so necessary to the mining industry. Sulphuric, hydrochloric, and nitric acids are manufactured at great profits.

Another quite prominent industry is the manufacture of *chocolate*, several large factories being devoted to the converting of the cocoa bean into this article. The Mexican chocolate when ground with cinnamon is highly valued.

Hardware is also manufactured, there being in the City of Mexico and other large centers a number of foundries where are manufactured a considerable amount of iron and galvanized-iron balconies, girders, columns, and other building material.

Felt hats are made in all the large cities, and *straw hats* everywhere.

The manufacture of *wooden and wax matches* is extensively carried on in the country, there being several match factories in the City of Mexico and a large number in Puebla.

A large business is done, although nowhere upon an extensive scale, in the manufacture of *dulces* (sweetmeats) and confections. This business presents a good opening for enterprise. Imported American candies sell in Mexico City for $1.65 per pound, silver.

Gunpowder is also manufactured to quite an extent. In 1897 the Department of Promotion entered into a contract with a capitalist to establish one or two fulminate factories to manufacture the article for mines and smokeless powder for sporting and military purposes.

Among the distinctively Mexican industries are the beautiful *drawn work*[a] and *feather work*, in the making of which, as well as in the pinning of horsehair *riatas*, or lassos, which every Mexican *charro* carries on the pommel of his saddle, the natives of the country are unexcelled. Even the peon's wife has a piece of drawn work with which to cover her husband's dinner basket. Mexican lace is also far famed.

Despite the fact that México is a large producer of cabinet woods, the manufacture of furniture is but little developed. The rich and well-to-do classes import nearly if not all of their furniture, upon which heavy duties are levied, and the poorer classes need but little, and that of the most humble description.

[a] In Silao, Guanajuato, a resident owns a beautiful tablecloth of drawn work and embroidery. It is pure linen, 13 feet long by 6½ wide. It took 30 Mexican women three years to complete it, and cost $10,000. It was exhibited at the Paris Exposition in 1900.

There are many brick, artificial stone, tile, lime, soap, varnish, paint, starch, musical instrument, harness, blank-book, and other manufactories.

New industries.—Since the first edition of the Handbook of México was issued the country has made great strides in the industrial and manufacturing field. A progressive Government has done all in its power to foster home manufacture, and has offered great inducements to those who wish to establish upon Mexican soil enterprises which will utilize within its borders those articles which its fecund soil produces. Smelting and reduction works, waterworks, electric plants, etc., are springing up throughout the country, and the columns of the Government Official Gazette are daily filled with applications for patents, waste lands, water privileges, railroad franchises, etc., all of which indicate that an era of prosperity has dawned.

A contract has been entered into for the establishment and operation of a stock yard as a permanent exposition and market in the Federal District, to be completed and ready for operation within five years.

The cattle market or stock yard shall cover an extent of ground sufficient for the corrals, yards, sheds, stalls, etc., that may be necessary for 5,000 cattle, 10,000 hogs, 5,000 sheep and goats, and 1,000 horses, and the buildings for offices, dwellings for employees, and rooms that may be used by purchasers and dealers. The concessionaire is expressly authorized to construct rail connections from the stock yard to the existing railroads and to establish telegraph and telephone lines for the service.

American capital.—Consul-General Barlow, in his report before mentioned, states that "the amount of United States capital invested in México by 1,117 United States companies, firms, and individuals, is, in round numbers, $500,000,000 gold. This amount has practically all been invested in the past quarter of a century, and about one-half of it has been invested within the past five years.

"The impetus given to México's industries by this enormous augmentation of the nation's working capital accounts in no small degree for the great industrial progress which it has made during the past twenty-five years. With México buying 58 per cent of all her imports from the United States and selling 80 per cent of all her exports to the United States, and with this enormous investment of United States capital in México, the commercial bond between the sister Republics is one that hardly can be broken, and is constantly growing in strength. The flow of United States capital into this Republic has apparently only begun, as each year México buys more from and sells more to the United States."

The following information is extracted from the same source:

More United States capital is invested in the railroads of México than in any other single line—about 70 per cent of the total. The

Mexican Central Railroad represents the largest single United States interest in México. The amount of $158,999,979.45, given as the capital employed, represents what has actually been paid out up to the present time for the construction and equipment of the road. The Mexican National is the next strongest, with a capital invested of $107,350,000.

Next in importance to the railroads, from the standpoint of United States capital invested, is the mining industry. The amount invested by United States capitalists in mining in México may be stated, in round figures, at $80,000,000. A large amount of this $80,000,000 is invested in up-to-date mining machinery, which is competently handled, and México's mineral wealth has been greatly increased by this United States investment.

Agriculture comes after mining in the amount of United States capital invested with $28,000,000. Next to railroads, mining, and agriculture, the largest United States interest in México is in manufacturing, in which United States capital is only beginning to assume importance. A number of important manufacturing enterprises, in which United States capital is heavily interested, are just starting or have plants in course of construction, as the large iron and steel works in Monterey.

Sinaloa leads the list of Mexican States in regard to the amount of United States capital invested in manufacturing enterprises. Most of this is engaged in a few large sugar refineries. The Federal District comes next, with a variety of large and small manufacturing enterprises. Nuevo Leon, whose capital, Monterey, is one of the principal manufacturing centers in the Republic, follows, with $2,500,000 of United States capital invested in her enterprises.

United States capital is also beginning to assume importance in the banking of México, and this interest is one that is growing rapidly. Next after banks, in the order of the amount of United States capital invested, come assay offices and chemical laboratories, ore buyers, ore testers, smelters, and refiners, all closely allied to the mining interest. All of México's large smelters are operated by United States capital.

United States firms have of late been building many electric light and power plants, gas plants, waterworks plants, telephone systems, and similar plants. The Mexican Telephone Company, operating the telephone system of México City, and the Mexican Telegraph Company, with a line to Veracruz from México City and a cable from Veracruz to Galveston, are the largest enterprises of this sort. In addition to building plants for their own operation, United States firms are building most of the telegraph and telephone lines and laying most of the cables for native and other foreign companies. Many of México's cities have recently undertaken or are now planning extensive municipal improvements, and in all of these the United States contractor is a conspicuous figure.

A recapitulation by States shows the Federal District, which practically means the City of México, to be credited with $320,800,000 of United States capital invested. Of this amount $281,800,000 is credited to the railways having their main offices in this city. The State showing the largest amount of United States capital invested is Coahuila, with $48,700,000; but of this amount $37,800,000 is credited to the Mexican International Railroad, which is not confined to the limits of that State. The next State in the order of United States capital invested is Sonora, with $37,500,000, of which $27,800,000 is claimed to be interested in mining enterprises. Of the total amount of $31,900,000 credited to Chihuahua $21,300,000 is in mining enterprises. Oaxaca and Nuevo Leon follow with $13,600,000 and $11,400,000, respectively.

ENCOURAGEMENT TO NEW INDUSTRIES.

In December, 1903, the Mexican Congress passed an act authorizing the Executive to grant concessions for establishing industrial enterprises new to the country, and without the intervention of Congress, for five years. This means the extension of act December 14, 1898, which is as follows:

"ARTICLE 1. The Executive is authorized for five years, counted from the date of the promulgation of the present law, to enter into contracts granting franchises and concessions, without prejudice to third parties, to concerns guaranteeing the investment of capital in the implantation and development of industries that are entirely new in the Republic on the following basis:

"I. The duration of the franchises and concessions shall be from five to ten years, according to the importance of the industry and the capital invested therein.

"II. The minimum capital to be invested in the introduction and exploitation of the industry shall not be less than $100,000, and it shall carry with it the minimum of franchises.

"III. That same capital shall be exempted from all direct Federal taxes for the entire duration of the contract.

"IV. The concessionaire may import on a single occasion free from customs duties the machinery, apparatus, utensils, and building materials necessary for the establishment of the industry and the erection of the buildings, subject to the revision of the list of importations by the Department of Promotion, and also giving a bond for each case of importation, said bond to be canceled as soon as the machinery has been set up and the use of the apparatus, utensils, or material has been proven.

"V. The concessionaires shall guarantee the performance of their contract obligations by means of a deposit in public-debt securities which shall be fixed by the Department of Promotion and which shall be made when the contract is signed.

"ART. 2. The importation privilege granted by this law shall be regulated by the Departments of Finance and Promotion."

"Under this act applications have already been filed for concessions to erect a plant for the manufacture of 'butterine and lard compound;' a factory for the manufacture of 'buttons, knife handles, and other articles of mother-of-pearl;' a 'hammer, pick, hoe, and ax handle factory;' and also a 'starch factory.'"

New concessions.—Among the new concessions granted by the Mexican Government to foster the industrial development of the country, the following are the most important:

Manufacture of incandescent lamps within the Republic, with a capital of $100,000 and a daily output of 1,000 lamps, to be increased in accordance with the demand.

Exploitation of all the guano deposits on the islands off the west coast of México, between Manzanillo and Mazatlán, including the islands known as Las Isabelas, Tres Marías, San Juanito, Las Marietas, Los Angeles, Isla de Afuera, Isla de Perlas, and the Isla del Medio. The object of the concessionaire is to dispose of the guano to the agriculturists of southern California for fertilizing their lands, and particularly the orange groves. The deposits are made by aquatic birds, such as cormorants and pelicans, millions of which make these islands their home during the breeding season, which occurs in April, May, and June of each year. As soon as the breeding season is over the birds desert the islands, migrating north, thereby leaving the nine months from July to March in which to collect and ship the guano. In April they return, and the deposits are renewed, thus making the supply continuous. The guano found on the islands in the Pacific Ocean off the west coast of México is considered to be of first quality, and contains about 12 per cent ammonia, 10 per cent phosphoric acid, and 3 per cent potash. According to the terms of the concession the concessionaire must pay to the Government 75 cents per ton for all the guano shipped from the islands. To guarantee the complete fulfillment of the obligations imposed on the concessionaire by the provisions of the concession, a deposit of $3,000 has been made.

A concession to exploit an extension of 70,500 hectares, equal to 174,206 acres, of heavily timbered land in the Territory of Quintana Roo, on the eastern part of the Yucatán Peninsula, for a term of ten years from December 28, 1903, the date of the promulgation of the concession in the "Diario Oficial." The concessionaire obliges himself not to cut mahogany or cedar trees measuring less than two meters in circumference at the base, and agrees to pay $1.50 for each tree over that measurement. A regular tariff, with quotas for each class of tree, is established. For dyewood logs the quota is $2 per ton; for chicle, $18 per ton; for rubber, $24 per ton, both of which are produced by trees growing wild in the forest. The concessionaire agrees

to exploit during the first two years at least 7,000 hectares, equal to 18,000 acres; during the next two following years at least 34,600 acres; and during the six following years at least 19,770 acres.

A concession to exploit for ten years a tract of national land measuring 247,777 hectares, equal to 602,257 acres, situated in the province of Balancán, in the State of Tabasco. The land is covered with mahogany, cedar, log or dye wood, and many varieties of construction timber; it also produces much chicle and resins. The concessionaire agrees to pay stipulated prices for the various kinds of trees he may cut; the general terms of the concession are as usual. The guarantee deposit in the national bank is $3,000 in bonds of the 3 per cent consolidated silver debt.

A concession for the purpose of breeding the common and the carey turtle in Lake Paso de Colombia, island of Cuzumel. The island is about 12 miles from the eastern coast of Yucatán, and is about 40 miles long by about 15 wide. The lease is for ten years, at $100 per annum. The guarantee deposit in the national bank is $1,000 in the usual bond of the 3 per cent consolidated silver debt.

The North American Beef Company has been granted a concession to build and operate two meat-packing establishments, one in the city of Uruapan, State of Michoacán, and the other at a point near the line of the Ferrocarril Veracruz al Pacífico. The company is also authorized to establish two plants for the manufacture of pepsin, margarin, oleomargarine, refined animal oils, etc., and for the utilization of all by-products in the manufacture of felts, brushes, combs, buttons, and fertilizers, as well as to build and operate a refrigerating plant and cold-storage warehouses in the City of México for the preservation of meat and other fresh-food products.

A concession for the extraction of dyewoods and cutting mahogany and other timbers, and to gather crude rubber and other resinous substances from the forests comprised in 161,224 hectares of public lands situated in the District of Peto, State of Yucatán. As a consideration for this privilege, the concessionaire binds himself to pay to the Government the following amounts in Mexican silver: $1.50 for each mahogany or cedar tree cut or proposed to be cut; 50 cents for each tree cut for construction timbers; $1 for each ton of wood; $2 for each ton of dyewoods; $18 for each ton of chicle gum extracted; $24 for each ton of crude rubber extracted; $1 annually for each hectare of land cultivated; 50 cents annually for each head of cattle pastured in the zone; 10 cents for each hectare of land exploited.

The duration of the contract is ten years, and the concessionaire agrees to exploit at least 17,000 hectares during the first two years, 34,000 during the two following years, and 22,000 hectares of land yearly during the remaining six years.

CHAPTER XI.

COMMERCE, DOMESTIC AND FOREIGN—STATISTICAL DATA—PORTS AND CUSTOMS DISTRICTS—TARIFF.

The history of the commercial development of México is too long to be followed step by step. The natives of the Western Hemisphere, even before its discovery and conquest, maintained a rudimentary commerce, and in México, among the Aztecs, such as were interested in international trade were highly honored, and were designated as Pohtecas. Instead of coins, copper pieces in T shape, grains or nuggets of gold, cacao nuts, etc., were used. True commerce, which necessarily entailed the use of metal coins, did not exist until the conquest, and it was not until the Spaniards found that gold and silver were becoming scarce that they thought of creating a trade between the new possessions and the mother country. As a consequence Spanish vessels loaded with merchandise began to arrive at the ports of Veracruz and Campeche, taking on their return trips immense cargoes of hides, indigo, tobacco, dyewoods, and other products. This trade increased with the foundation of the mint in México, which was the first to be established in the New World, but it was hampered to a great extent by the difficulties encountered between Spain, and México and the English and French pirates who infested the ocean. The port of Acapulco was open to the products of the Philippine Islands, which were so valuable that it was claimed that each vessel freighted at Manila had on board merchandise worth 2,000,000 pesos. Trade then sprang up with China, Japan, and Perú, so that México, in the sixteenth century, was the greatest commercial center of the then known world. During the seventeenth and eighteenth centuries domestic trade began to be developed, and foreign commerce fell off, owing to the constant wars between Spain and the various European States.

At the beginning of the nineteenth century the foreign trade of the Republic revived, reaching, it is claimed, the sum of 25,000,000 pesos for imports and over 16,000,000 for exports. Until about thirty years ago, however, the unsettled condition of the country was a serious impediment to this line of development; but peace being then established, railroads were constructed, bringing with them increased activity in commerce, industries, and the arts—in short, of every branch of public prosperity and wealth.

Domestic trade.—The domestic trade of the country is made up of the interchange of natural products and the products of native industry for such as are not indigenous to the country, or, if so, are produced on too small a scale to meet the requirements of native consumption; hence the necessity for importing such goods as are required to make up the balance of trade.

Foreign trade.—The principal exports of México are precious metals, henequén, coffee, cattle, etc., while the principal imports are machinery, cotton textiles, iron and steel, wines and liquors, wood and paper and manufactures thereof, and textile fibers.

Don Salvador Echegaray, director of the Bureau of Statistics of México, in a paper read before the International Commercial Congress in Philadelphia, October, 1899, made in substance the following statements in regard to Mexican trade development:

"During the last twenty-five years the Republic of México, under President Diaz's government, has enjoyed peace; the construction of 10,000 miles of railroads, the improvement of some of the ports, the general development of the country, and increase of public wealth have been made possible.

"Imports which in the fiscal year of 1874–75 did not reach 19,000,000 Mexican dollars, in the last fiscal year (1898–99) amounted to 106,285,307 dollars silver, an increase of nearly 600 per cent. Exports in 1875 were 27,318,788 in Mexican dollars, and in the last year 138,478,137 Mexican dollars, an increase of 500 per cent.

"The foreign commerce of México in the last seven fiscal years has been as follows:

Year.	Importation (declared value in gold).			Exportation (declared value in silver).		
	From United States.	From other countries.	Total.	To United States.	To other countries.	Total.
1892–93	$26,235,963	$17,177,168	$43,413,131	$63,791,741	$23,717,466	$87,509,207
1893–94	14,351,785	15,935,704	30,287,489	60,660,243	18,683,044	79,343,287
1894–95	15,130,367	18,870,073	34,000,440	67,322,986	23,531,967	90,854,953
1895–96	20,145,763	22,108,175	42,253,938	79,651,695	25,365,207	105,016,902
1896–97	22,593,869	19,610,235	42,204,095	86,742,951	24,603,543	111,346,494
1897–98	21,490,604	22,112,888	43,603,492	94,974,616	33,998,133	128,972,749
1898–99	24,164,687	26,704,507	50,869,194	103,553,486	34,924,651	138,478,137
Total	144,113,029	142,518,750	286,631,779	556,697,718	184,824,011	741,521,729

Referring to the general condition of trade, the same authority stated that the greater demands for cotton goods in México, due to the increase of public welfare and population, produces scarcely any effect in the increase of imports of foreign cottons, because the new demand has been supplied by the native factories, of which there are a large number equipped with every modern improvement. Foreign beer has practically disappeared from Mexican markets, its place being filled by excellent domestic beer.

"The low price of silver has produced an entirely different effect on the silver production in México than it did in the United States. When

the price of this metal reached a certain point in that country several mines had to be closed, while in México veins were daily opened, the cost of production remaining almost the same, its extraction, labor, and transportation being paid as formerly.

"México's industrial awakening can not be credited solely to the depreciation of silver. The construction of railroad lines and the introduction of foreign capital, attracted by the facilities granted by the Government, are factors which have contributed to the flourishing conditions of the country. The profitable exportation of some products increases their prices for home consumption, but staple products, such as corn and beans, have suffered no alteration."

Referring to the commercial methods of México, the same authority makes the following statement:

"The report of the American consul-general for the year 1899 says: 'As the terms of our American merchants are often very rigid, it is hard to reach an agreement, and much trade which by the exercise of a little tact and judgment could be handled by American merchants goes elsewhere.' Mexican merchants are noted for their integrity. The quoted report about commerce and industries in México says: 'There are very few concerns here doing business that have not ample capital to carry out all contracts into which they may enter. Failures are very rare, indeed, and when they do occur are carefully investigated by the authorities in the interest of creditors, and any attempts to defraud are severely punished. Book entries are regarded as sacred. All books kept by business houses are known and small stamp taxes paid on them, and thus a sort of surveillance is kept over them by the Government authorities.'

"The growing prosperity of foreign commerce gives the measure of the progress of the country, but what confirms even more the optimistic opinions about the future of México is the figures showing the constant increase in the public revenue, due only to a greater return from the productive sources and not to new or higher taxes."

The foreign trade of the Republic since 1898–99, the latest figures quoted above has been as follows:

	Importation (declared value in gold).			Exportation (declared value in silver).		
	From United States.	From all other countries.	Total.	From United States.	From all other countries.	Total.
1899–1900	$31,026,415	$30,291,760	$61,318,175	$116,102,285	$33,954,075	$150,056,360
1900–1901	35,189,955	29,893,498	65,083,453	117,228,991	31,490,011	148,659,002
1901–2	39,016,679	27,212,308	66,228,987	130,323,347	29,579,976	159,903,323
Total	105,233,049	87,397,566	192,631,615	363,654,633	94,964,062	458,618,685

EXPORTS.

Exports from México for the month of June, 1903, and for the fiscal year 1902–3 are shown in the following figures issued by the Mexican

Government; the corresponding valuations for the preceding fiscal year being also given for purposes of comparison:

EXPORTS.

[Silver valuation.]

	June—		Twelve months ending June—	
	1903.	1902.	1903.	1902.
Precious metals	$6,402,512.39	$4,880,980.16	$91,763,481.81	$68,947,728.17
Other articles	11,945,074.11	8,564,817.95	105,965,487.46	90,955,595.49
Total	18,347,586.50	13,445,798.11	197,728,968.77	159,903,323.66

The details of the export trade for the periods under comparison show the following classification and figures:

	June—		Twelve months ending June—	
	1903.	1902.	1903.	1902.
Mexican gold coin	$450.00	$1,481.00	$106,630.00	$95,720.00
Foreign gold coin			9,329.00	78,248.00
Gold in bars	1,414,908.81	696,605.18	13,264,276.67	8,698,822.57
Gold in other forms	104,976.33	50,457.79	828,553.60	442,470.94
Total gold	1,520,335.14	748,543.97	14,208,788.27	9,315,256.51
Mexican silver coin	132,375.00	52,000.00	21,098,739.00	11,351,765.00
Foreign silver coin		39,357.00	85,540.67	259,578.98
Silver in bars	3,616,480.06	3,567,167.60	46,357,391.36	41,087,963.17
Silver in other forms	1,133,322.19	503,911.59	10,013,022.01	6,963,169.51
Total silver	4,882,177.25	4,132,436.19	77,554,693.04	59,632,471.66
Copper	2,790,465.38	1,294,354.00	20,122,338.42	16,849,834.87
Lead	395,529.16	488,670.00	5,669,070.21	5,730,845.30
Other mineral products	184,146.00	137,917.00	1,181,786.95	546,771.25
Coffee	651,866.50	718,871.65	9,021,501.09	10,228,858.31
Henequén in fiber	3,284,042.00	3,314,133.00	32,620,579.50	29,209,515.00
Woods	134,940.00	85,204.22	1,837,736.50	1,708,770.78
Dyewoods	147,414.00	140,626.08	964,015.46	1,288,771.84
Leaf tobacco	55,408.00	127,957.00	1,388,301.86	975,878.32
Other vegetable products	1,251,355.60	871,076.20	12,022,788.00	8,534,683.79
Cattle	866,293.00	634,462.00	7,000,676.50	5,033,958.36
Raw hides	377,029.72	427,848.55	7,466,481.50	6,286,577.92
Other animal products	89,217.00	72,318.00	795,672.99	615,418.04
Henequén, manufactured	646,140.00	63,040.00	1,355,653.00	1,485,184.00
Tobacco, manufactured	55,022.00	56,442.00	654,229.09	626,462.08
Other manufactures	965,959.50	84,455.80	3,123,783.94	1,359,442.31
Miscellaneous	50,251.25	47,392.45	745,877.95	474,623.32

Following is a résumé of the valuations of Mexican exports during the periods under comparison with reference to their countries of destination:

	June—		Twelve months ending June—	
	1903.	1902.	1903.	1902.
Europe	$5,456,014.07	$1,634,046.58	$47,407,134.08	$23,957,099.32
Asia			30,000.00	500.00
North America	12,282,757.43	11,104,026.78	143,771,108.36	130,344,432.29
Central America	13,700.00	90,897.75	359,042.52	851,865.16
South America	3,369.00	2,794.00	58,251.81	60,484.89
West Indies	641,746.00	614,083.00	6,108,432.00	4,688,942.00

Export valuations to the United States in 1902–3 aggregated $143,759,758, as compared with $130,323,347 in the preceding fiscal year.

Exports during the first quarter of the fiscal year 1903–4, as compared with figures of the corresponding period in the preceding year, were as follows:

[Declared silver values.]

	1903–4.	1902–3.	Increase (+) or decrease (−) 1903–4.
MINERAL PRODUCTS.			
Mexican gold coin	$10,782.00	$35,021.00	− $24,239.00
Foreign gold coin	822.00	2,158.00	− 1,336.00
Gold in bars	4,683,447.07	2,283,912.47	+ 2,399,534.60
Gold in other forms	197,292.12	96,727.53	+ 100,564.59
Total gold exports	4,892,343.19	2,417,819.00	+ 2,474,524.19
Mexican silver coin	2,723,163.00	10,751.00	− 2,064,614.00
Foreign silver coin	10,526.00	28,916.00	− 18,165.00
Silver in bars	11,725,113.47	10,106,101.37	+ 1,619,012.10
Silver in other forms	2,957,985.62	884,660.62	+ 2,073,325.00
Total silver exports	17,417,013.09	16,746,077.99	+ 670,935.10
Total gold and silver	22,309,356.28	19,163,896.99	+ 3,145,459.29
Copper	5,604,413.41	4,658,881.95	+ 945,531.46
Lead	1,370,848.56	1,314,702.00	+ 56,146.56
Other mineral products	324,548.84	150,683.87	+ 173,864.97
Total mineral products	29,609,167.09	25,288,164.81	+ 4,321,002.28
VEGETABLE PRODUCTS.			
Coffee	659,257.80	896,312.50	− 237,054.70
Henequén	6,774,476.00	6,586,991.00	+ 187,485.00
Woods	387,015.00	448,112.90	− 61,097.90
Dye woods	249,439.00	235,032.37	+ 14,406.63
Leaf tobacco	102,908.00	119,245.00	− 16,337.00
Other vegetable products	3,907,652.70	2,746,842.23	+ 1,160,810.47
Total vegetable products	12,080,748.50	11,032,936.00	+ 1,047,812.50
ANIMAL PRODUCTS.			
Cattle	1,111,132.00	1,497,461.50	− 386,329.50
Raw hides	1,372,796.87	1,281,789.10	− 8,792.23
Other animal products	153,059.00	152,881.00	+ 319.00
Total animal products	2,637,128.87	3,031,931.60	− 394,812.73
MANUFACTURED PRODUCTS.			
Henequén rope, bagging, etc	847,205.00	377,383.00	− 30,178.00
Tobacco, manufactured	99,193.24	152,513.00	− 53,319.76
Other manufactured products	1,182,007.50	290,150.25	+ 891,857.25
Total manufactured products	1,628,405.74	820,046.25	+ 808,359.49
Miscellaneous	144,290.06	316,360.13	− 172,070.07

SUMMARY OF EXPORTS.

Precious metals	$22,309,356.28	$19,163,896.99	+$3,145,459.29
Other articles	23,790,293.98	21,325,441.80	+ 2,464,852.18
Total	46,099,650.26	40,489,338.79	+ 5,610,311.47

The value of the merchandise exported is stated in silver currency, as declared by the exporters in the custom-houses, at current commercial prices; to the value of the gold is added the difference between the prices calculated at the conventional rate of $675.416 per kilogram and the commercial price as declared by the exporters; the value of the silver exported is calculated at the conventional rate of $40.915 per kilogram.

This rectification makes the general statement of the exports in the two periods under comparison as follows:

Exports, first quarter—	
1903–4	$52,480,932.22
1902–3	43,938,721.84
Increase, 1903–4	8,542,210.38

equal to an increase of 19.44 per cent in the trade of the first three months of the current fiscal year 1903–4 as compared with the corresponding period of 1902–3.

Agricultural products.—The following tables show the returns of exportations in the fiscal years of 1890–91 to 1901–2 on heniquén, rubber, chicle gum, cabinet woods, and dyewoods:

Fiscal year.	Heniquén, unmanufactured.	Cordage.	Rubber.	Chicle.	Dyewoods.	Woods.	
						Ordinary.	Cabinet.
	Kilos.	*Kilos.*	*Kilos.*	*Kilos.*	*Kilos.*	*Cu. meters.*	*Cu. meters.*
1890–91	53,531,119	150,630	92,150	1,117,224	32,287,105	1,008	53,576
1891–92	56,103,279	234,440	64,183	1,133,717	23,186,127	4,604	54,077
1892–93	60,413,136	10,921	53,481	799,006	33,263,061	2,483	39,666
1893–94	56,507,450	17,911	76,830	1,202,601	48,110,614	960	44,135
1894–95	67,143,583	13,435	85,986	758,471	68,399,335	533	118,667
1895–96	59,329,309	12,729	82,943	1,448,805	108,896,408	662	56,271
1896–97	71,085,535	6,162	64,843	2,122,337	72,867,009	826	65,699
1897–98	75,183,816	61,047	87,420	891,612	54,509,702	323	71,518
1898–99	70,998,509	656,650	191,588	968,406	37,350,459	944	75,663
1899–1900	79,432,207	3,386,693	260,175	845,386	47,493,811	24,719	50,629
1900–1901	75,840,465	2,275,982	189,048	1,173,700	42,169,692	19,160	69,692
1901–2	91,944,355	3,762,530	180,364	1,804,153	40,626,944	12,692	52,272
Total	817,513,053	10,589,080	1,481,111	14,265,418	618,160,307	68,914	751,865
Average	68,126,088	882,423	119,259	1,188,784	51,513,358	5,742	62,656

Heniquén exports.—The figures referring to heniquén, of which the production has steadily risen, are the most typical, and at the same time the rate of exchange and the gold price of the fiber on the New York market have also advanced.

The following table, embracing the same number of years as the foregoing, shows the exportation of unmanufactured heniquén, expressed in kilograms, its value in silver and in gold, and, moreover, the mean rate of exchange:

Fiscal year.	Unmanufactured heniquén.	Value.		Mean rate of exchange.
		Silver.	Gold.	
	Kilos.			*Per cent.*
1882–83	28,763,307	$3,073,960	$2,748,120	0.894
1883–84	45,180,421	3,923,673	3,460,689	.882
1884–85	45,549,367	3,905,898	3,417,660	.875
1885–86	39,474,732	2,844,355	2,457,722	.864
1886–87	38,987,390	3,799,396	3,100,307	.816
1887–88	36,450,676	6,160,164	4,866,529	.790
1888–89	38,159,067	6,818,658	5,175,361	.759
1889–90	39,174,025	7,356,479	5,435,637	.739
1890–91	53,531,119	7,021,306	5,617,044	.080
1891–92	56,103,279	6,358,220	4,514,336	.071
1892–93	60,413,136	8,889,845	5,318,382	.632
1893–94	56,507,740	6,712,733	3,389,930	.505
1894–95	67,143,583	7,720,068	3,962,459	.513
1895–96	59,329,309	7,763,821	3,625,408	.536
1896–97	71,085,535	7,431,852	2,750,517	.506
1897–98	75,183,816	11,564,519	5,180,905	.448
1898–99	70,998,509	18,711,325	8,813,634	.471
1899–1900	79,432,207	26,099,388	12,423,309	.476
1900–1901	75,840,465	16,402,316	8,004,380	.488
1901–2	91,944,355	29,209,515	12,881,396	.441
Average	68,126,088			

Exports of henequén during the calendar year 1903, from Yucatán through the ports of Progreso and Campeche, consisted of 611,939 bales, valued at $36,040,032.32. The distribution of the bales was as follows:

United States	596,676
Cuba	8,066
England	4,286
Canada	1,200
France, Spain, Germany, Belgium	1,711
Total	611,939

The exports of henequén during the last five years were:

1899	445,978
1900	499,626
1901	517,519
1902	528,246
1903	611,939

Coffee exports.—The quantity of coffee exported by México in 1902 was 22,566,013 kilograms, or 49,735,493 pounds. This amount was produced by the following States and Territories:

	Kilos.		Kilos.
Lower California	60	Sonora	90
Coahuila	1,632	Tabasco	19,558
Colima	9,760	Tamaulipas	85,152
Chiapas	2,134,313	Tepic	26,615
Chihuahua	112,249	Veracruz	19,285,608
Oaxaca	676,165	Total	22,566,013
Sinaloa	82,381		

The value declared in the invoices presented at the custom-houses amounted to $10,614,759 Mexican currency.

The distribution of the coffee exported was as follows:

	Kilos.		Kilos.
Germany	3,532,782	United States	15,029,797
Austria	56,070	France	1,945,748
Belgium	12,261	Holland	42,986
Canada	32,480	Great Britain	1,694,167
Cuba	51,893	Italy	264
Chile	4,130	Total	22,566,013
Spain	163,428		

General export trade.—For the fiscal years 1900–1901 and 1901–2, Mexican exports to the rest of the world are estimated by the "Anuario Estadístico Fiscal," 1901–2, at the following figures, showing an increase of $11,244,322 in favor of the latter year:

	1900–1901.	1901–2.
Europe	$25,781,057	$23,957,009
Asia		500
North America	117,229,711	130,344,432
Central America	504,091	851,865
South America	47,626	60,484
West Indies	5,146,515	4,688,942
Total	148,659,000	159,903,322

The principal countries where México sent its products during said two fiscal years were the following:

	1900–1901.	1901–2.	Increase + or decrease (−) 1902.
United States	$117,228,991.15	$130,323,347.29	+13,094,356.14
Great Britain	12,033,076.81	10,572,484.29	− 1,460,592.52
Cuba	5,146,515.00	4,688,942.00	− 457,573.00
Germany	5,018,464.02	4,813,313.54	− 205,150.48
Belgium	4,422,728.41	5,485,793.50	+ 1,063,065.09
France	2,824,303.13	2,215,306.60	− 608,996.53
Guatemala	366,388.60	473,288.64	+ 106,900.04
British Honduras	109,055.00	88,160.00	− 20,895.00

Silver and gold values.—"El Economista Mexicano" of August 8, 1903, publishes the following very interesting statement showing the amount, in Mexican silver dollars, of Mexico's export trade during each fiscal year from 1881–82 to 1901–2, the average value of the Mexican silver dollar in New York during each year of that period, and these annual amounts reduced from silver to gold at the corresponding yearly average value of the Mexican silver dollar in New York:

	Exports, silver value.	Average value Mexican dollars in New York.	Exports, gold value.
1881–82	$29,206,772	$0.894	$26,110,854
1882–83	41,919,182	.882	36,972,719
1883–84	46,861,117	.875	41,003,477
1884–85	46,811,958	.864	40,445,532
1885–86	43,797,249	.816	35,738,555
1886–87	49,329,915	.790	38,970,633
1887–88	40,078,717	.759	37,232,746
1888–89	60,380,287	.739	44,621,082
1889–90	62,080,539	.758	47,511,849
1890–91	63,425,746	.837	58,087,349
1891–92	75,660,880	.837	63,328,157
1892–93	88,044,624	.657	57,845,318
1893–94	80,083,944	.539	43,165,246
1894–95	95,020,326	.514	48,840,448
1895–96	110,022,356	.536	58,971,983
1896–97	117,784,092	.506	59,127,614
1897–98	138,068,504	.448	61,854,690
1898–99	148,453,834	.471	70,070,210
1899–1900	158,247,933	.476	75,326,016
1900–1901	158,009,437	.488	77,266,639
1901–2	168,041,272	.441	74,106,201

It is apparent from these figures that while the silver value of México's exports in this period of twenty-one years has increased very

notably, the gold value has not increased in corresponding proportion. These figures show that the increase in México's exports in silver value in 1901–2 is $138,834,500 over the exports in 1881–82; the apparent increase in gold value is only $47,995,347, applying the average value of the Mexican dollar in each respective year. But if the average value of the Mexican dollar in 1881–82, namely, 0.894, is applied to the silver value of the exports in 1901–2, the result is a gold value of $150,000,000 in round numbers, as compared with $74,000,000 gold value, which results from the average value of the Mexican dollar in 1901–2, namely, 0.441, clearly showing a loss for México of $76,000,000 in her own silver dollars.

Live stock.—The Mexican consul at Habana, in an interesting report made to his Government concerning the exportation of live stock from México to Cuba, recommends that the stock should come from the warmer regions of the Mexican Republic and not from the colder portions or high table-lands, inasmuch as stock from the latter places are hard to fatten and die in considerable numbers before they become acclimated. At the present time there is a greater demand in Cuba for Mexican cattle than there is for horses and mules. Bulls are more sought after in the Cuban markets than steers, and mares find a readier sale than either horses or mules. But few Mexican neat cattle are imported into Cuba. A large number of lean cattle are bought by the stock growers and planters to be fattened on Cuban plantations and haciendas.

IMPORTS.

For the fiscal year 1902–3 and the twelve months ending in June, 1903, the imports of México, according to official figures, were valued as follows:

IMPORTS.

[Gold valuation.]

Classification.	June—		Twelve months ending June—	
	1903.	1902.	1903.	1902.
Animal substances	$402,354.92	$426,646.70	$4,740,354.56	$4,878,582.48
Vegetable substances	1,030,737.92	973,059.23	13,525,221.49	11,108,411.51
Mineral substances	2,281,675.43	2,867,946.37	24,014,996.53	21,223,548.29
Dry goods	779,918.69	698,844.34	9,766,080.64	8,409,332.81
Chemical and pharmaceutical substances	312,553.08	223,289.25	2,791,622.83	2,668,496.88
Beverages	304,239.59	323,042.21	3,133,238.06	2,852,567.99
Paper and its applications	192,347.14	198,196.80	1,925,280.46	1,922,830.79
Machinery and apparatus	1,037,247.55	1,007,011.54	10,337,060.06	8,398,185.96
Vehicles	177,357.89	185,917.82	1,712,989.68	1,401,127.34
Arms and explosives	223,230.75	120,761.83	1,796,991.85	1,401,604.52
Miscellaneous	193,940.32	186,726.92	2,157,918.80	1,964,279.40
Total	6,935,603.28	7,211,445.01	75,901,754.96	66,228,987.97

The valuation of Mexican imports during the periods under comparison with reference to their countries of origin is as follows:

Country.	June—		Twelve months ending June—	
	1903.	1902.	1903.	1902.
Europe	$3,157,134.85	$2,777,338.73	$34,205,291.69	$26,379,200.51
Asia	86,505.73	51,076.74	696,718.46	514,319.08
Africa	9,720.00	5,615.75	80,348.69	25,030.06
North America	3,651,358.12	4,357,323.44	40,514,545.21	39,032,190.63
Central America	3,624.08	1,427.85	21,931.04	32,997.93
South America	17,412.50	13,038.50	195,444.19	156,101.38
West Indies	9,316.00	5,430.00	129,554.93	53,851.65
Oceania	532.00	194.00	57,920.75	35,296.73

Of the total valuation of imports for the fiscal year 1902–3 the United States furnished $40,496,671.96, as compared with $39,016,676.08 in the preceding year.

Imports for the first quarter of the fiscal year 1903–4, as compared with the corresponding figures for 1902–3, show the following fluctuations:

[Invoice gold values.]

Classification.	1903–4.	1902–3.	Increase (+) or decrease (−), 1903–4.
Animal substances	$1,155,318.88	$1,043,445.90	+$111,872.98
Vegetable substances	2,776,945.96	2,745,068.67	+ 31,877.29
Mineral substances	5,529,005.85	6,121,455.75	− 592,449.90
Dry goods—draperies	2,322,315.32	2,475,735.21	− 135,419.89
Chemical and pharmaceutical substances	701,786.38	667,253.01	+ 34,483.37
Beverages—spirituous, fermented, and natural	770,389.66	768,691.29	+ 1,698.37
Paper and its applications	480,508.49	487,681.12	− 7,172.63
Machinery and apparatus	2,239,701.00	2,573,380.22	− 333,679.22
Vehicles	525,534.09	379,329.28	+ 146,204.81
Arms and explosives	387,685.62	368,024.19	+ 19,661.43
Miscellaneous	560,343.68	479,255.90	+ 81,087.78
Total	17,449,484.93	18,091,320.54	− 641,835.61

Reducing these gold values to Mexican silver currency, at the customs equivalents, the results are:

	Gold value.	Mexican currency.
1903–4	$17,449,484.93	$39,998,818.13
1902–3	18,091,320.54	43,871,390.67
Decrease, 1903–4	641,835.61	3,882,572.54

The decrease in 1903–4 is equal to 8.85 per cent in the imports as compared with the same period in 1902–3.

Imports for the fiscal year 1900–1901 and 1901–2 from all countries are officially estimated at the following figures, showing an increase of $1,145,534.68 in favor of 1901–2:

Country.	1900–1901.	1901–2.
Europe	$28,956,971.89	$26,379,200.51
Asia	545,410.29	514,319.08
Africa	26,938.62	25,030.06
North America	35,201,400.35	39,032,190.63
Central America	70,044.75	32,997.93
South America	140,212.27	156,101.38
West Indies	58,009.00	53,851.65
Other countries	84,466.12	35,296.73
Total	65,083,453.29	66,228,987.97

The principal countries represented in the import trade of México were the following:

Country.	1900–1901.	1901–2.	Increase (+) or decrease (−), 1902.
United States	$35,189,955.85	$39,016,676.08	+$3,826,720.23
Great Britain	9,924,553.34	8,264,127.08	− 1,660,426.26
Germany	7,079,958.15	6,425,208.24	− 627,749.91
France	6,564,235.65	6,285,858.72	− 278,376.93
Spain	2,856,774.65	2,720,072.77	− 136,701.88
Belgium	758,706.56	1,074,743.17	+ 316,036.61
Italy	536,208.15	397,450.60	− 138,752.55

Of the total imports during the year in reference $14,778,706.44 were free of duty, while the dutiable goods amounted to $51,450,287.

The leading among the free articles imported were railroad material, $2,372,746; coal, $2,123,869; coke, $2,088,670; lumber and timber, $1,875,347; mineral substances, $1,728,077; railway cars and coaches and repairs, $780,677.

Among the dutiable goods the largest imports were as shown below:

Animals and animal products:	
Live stock (all kinds)	$567,505
Wool	192,707
Raw skins and hides	81,102
Canned meats, fish, butter, etc	516,472
Butter	119,558
Condensed milk	71,543
Lard	766,757
Cheese	181,078
Stearin	244,610
Furs and skins, and manufactures of	524,880
Boots and shoes	705,000
Manufactured animal products	355,439
Vegetable substances:	
Ginned cotton	1,271,958
Other fibers	126,112
Cacao (all kinds)	165,834
Dried fruits	165,215
Wheat and other cereals	1,439,400
Almonds (all kinds), shelled	168,664
Fresh fruits, etc	350,639
Virginia leaf tobacco	203,976
Olive oil	124,986
Cotton-seed oil (crude)	904,167
Lumber and timber	217,326
Manufactures of wood	386,803
Bags and bagging	308,213
Furniture (all kinds)	628,910
Mineral substances:	
Gold, silver, and platinum, and manufactures of	191,020
Copper and alloys, in bars and plates	127,709
Copper and alloys, manufactures of	807,731
Manufactures of tin, lead, and zinc	206,311
Iron wire for fences	362,956
Plows and plowshares	79,039

Mineral substances—Continued.	
Iron pipes (all sizes)	$1,040,611
Agricultural implements	237,427
Iron bands	210,500
Iron sheets for roofing (all kinds)	662,752
Tin plates	237,268
Iron girders and beams	470,050
Manufactures of tin, galvanized iron, etc	291,206
Manufactures of iron, enameled, etc	145,911
Manufactures of iron, not specified	506,680
Nails, tacks, screws, etc	343,254
Lime, Portland cement, etc	410,670
Mineral oils (crude)	654,826
Paraffin	289,427
Glass bottles	300,708
China and earthen ware	325,727
Crystal and glassware, n. e. s	470,754
Textiles, and manufactures of:	
Cotton thread, on spools	703,799
Cotton thread, in balls and skeins	236,955
Lace of all kinds, and manufactures of, n. e. s	225,618
Cottons, not more than 30 threads per square of 5 millimeters	622,990
The same, over 30 threads	127,798
Cotton prints, not exceeding 30 threads per square of 5 millimeters	578,981
The same, exceeding 30 threads	126,935
Cotton cloth, openwork or embroidered	26,501
Stockinet and manufactures of, n. e. s	351,762
Cotton braids, trimmings, etc	137,250
Elastic webbing	22,377
Cotton edgings, insertions, etc., embroidered with cotton, linen, wool, or silk	147,303
Cloth, linen, hemp, or other like fibers, white, drab, or colored, plain woven, over 12 threads per square of 5 millimeters	204,225
Woolen cloths (all weavings and kinds)	1,297,116
Silk fabrics (all weavings and kinds)	301,049
Articles and manufactures of silk, n. e. s	292,432
Cloth of silk warp, and cotton, linen, or wool filling, or vice versa	412,118
Articles of silk, with mixture of cotton, linen, or wool, all kinds	285,336
Chemical and pharmaceutical products:	
Drugs and medicines of all kinds	289,721
Colors, powdered, in crystals, or prepared	421,328
Caustic soda and potash	287,976
Sulphate of copper, iron, and ammonia	268,519
Spirituous, fermented, and natural beverages:	
Rum, in glass	700,006
Rum, in casks	166,512
Beer and cider, in glass	161,419
White and red wine, in the wood	1,060,774
White and red wine, in the glass	388,323
Sparkling wines	166,654
Paper and its manufactures:	
Wrapping paper	192,949
Cigarette paper	351,890
Cardboard, manufactures of, n. e. s	131,994

Machinery and apparatus:	
Pumps and turbines	$161,420
Hardware of all kinds for trades	491,529
Musical instruments (all kinds)	368,097
Steam engines, and parts of	2,190,533
Machinery and apparatus of all kinds, n. e. s., for power other than hand or foot	3,636,063
The same, for foot or hand power	831,686
Printing and lithographic presses and accessories	168,700
Vehicles:	
Carts, wagons, and cars without springs, for freight	106,089
Wheelbarrows, one or two wheels	187,721
Carriages, all kinds, n. e. s.	178,423
Arms and explosives:	
Breech-loading firearms, of all kinds, and accessories	211,855
Loaded and empty shells for firearms	135,608
Dynamite and other explosives, n. e. s.	713,101
Fuses and detonators for mining	96,816
Miscellaneous:	
Lubricating oils	171,620
Manufactures of gutta-percha and celluloid, n. e. s.	200,345
Hats, all kinds, and accessories	356,971
Rubber belts for machinery	100,267
Rubber hose	114,119
Iron, steel, and wood buildings	283,776
Perfumery	205,818

TRADE WITH THE UNITED STATES.

Figures issued by the Bureau of Statistics of the Treasury Department of the United States show that the trade of México with the United States has grown more rapidly than that with any other part of the world. The exports from the United Kingdom to México grew from $8,000,000 in 1831 to $10,250,000 in 1900; those from France to México fell from $9,000,000 in 1881 to $7,000,000 in 1899; those from Germany grew from $700,000 in 1881 to $5,000,000 in 1899, and those from Spain from $871,000 in 1881 to a little less than $2,000,000 in 1900; while from the United States the exports to México grew from $11,000,000 in 1881 to $35,000,000 in 1900 and over $40,000,000 in 1902. Imports of Mexican goods by the United States have expanded in the same period from $28,000,000 to $41,000,000. It will thus be seen that México occupies a unique position in the ranks of the nations with which the United States transacts a considerable exchange, as it is with this country alone that a balance between exports and imports is preserved. From the West Indies the United States imports are nearly twice as large as its exports. To Canada the United States sells twice as much as she buys; from South America the receipts are three times as great as the exportation values, while Europe takes from the United States threefold what she finds a market for in the latter country.

Contiguity, quick rail communication, and the presence of large United States interests in México are the principal causes of the rapid gains which the United States is making over her rivals in the trade of México. Over 9,000 miles of railroad are now in operation in México, bringing all parts of that country into direct communication with the United States, and according to the statement before quoted furnished to the State Department by the United States consul in México, fully $400,000,000 of capital from the United States is invested in that country, and many citizens of the United States are located temporarily or otherwise in México. México is the one country south of the United States to which her exports show an appreciable growth. To the Central American States United States exports in 1890 were $5,296,478, and in 1902 they were $6,322,685; to South America in 1890 United States exports were represented by $33,752,648, and in 1902 they were $38,043,617; to the West Indies they were $33,197,222 in 1890, and $43,632,951 in 1902, while to México they were $13,285,287 in 1890, and advanced to $39,873,606 in 1902 (fiscal year), while for the calendar year 1902 they are estimated at more than $40,000,000.

The most important exports from the United States to México consist of manufactures of iron and steel, machinery, unmanufactured cotton, lumber, manufactured wood, manufactures of cotton, and gunpowder. México's exports to the United States are chiefly textile fibers, especially sisal or henequén, coffee, hides, cattle, lead, copper, and tobacco, and in addition to these there are large quantities of silver in ore and considerable gold which are not included in the figures given for exports of merchandise.

In the year ended June 30, 1903, the value of goods imported from México amounted to $41,313,711, while on the other hand, she purchased from United States merchants $42,257,106 worth. According to the latest available Mexican statistics, about 60 per cent of the total value of goods imported by that country in the fiscal year 1902 came from the United States, as compared with a little over 55 per cent in 1890. Of the goods exported from México the United States took about 80 per cent in 1902 and about 68 per cent in 1890.

The following table shows the value of United States exports to and imports from México at decennial periods from 1850 to 1900, and annually from that date:

Year.	Exports.	Imports.	Year.	Exports.	Imports.
1850	$2,012,827	$575,200	1900	$34,974,961	$28,646,053
1860	5,324,718	1,903,431	1901	36,475,350	28,851,635
1870	5,859,700	2,715,665	1902	39,873,606	40,382,596
1880	7,866,493	7,209,593	1903	42,257,106	41,313,711
1890	13,285,287	22,690,915			

This table shows that while United States commerce with México varies considerably, the trade in both directions has more than maintained its satisfactory volume.

Copper and vegetable fibers form the largest individual items of United States imports from México, and iron and steel products constitute the largest exports to that country from the United States. In 1902 United States imports of copper ore and regulus were almost $10,000,000, as compared with less than $100,000 in 1892; imports of pigs, bars, ingots, etc., of copper increased in the same time from $84,000 to nearly $3,750,000. In 1892 no copper ore was exported to México, but in 1902 nearly $700,000 worth was so exported. Of unmanufactured vegetable fibers (mainly sisal grass or henequen), United States imports increased from $5,500,000 to over $12,000,000, while of the manufactures of these materials, imports increased from $6,000 to nearly $650,000, and the exports from $58,000 to $228,000. Hides and skins were imported to the value of nearly $3,500,000 in 1902—more than double the 1892 value—while of leather and its manufactures the value of exports increased from $61,000 to $818,000. Imports of coffee fell off during the decade from over $4,000,000 to less than $3,000,000.

Exports of iron and steel not only constitute the largest item of trade between México and the United States, but show the largest growth in the last ten years, exports of machinery alone increasing from about $1,500,000 to over $7,000,000. Other items which show large gains are breadstuffs, vehicles, chemicals, coal and coke, copper ore, vegetable oils, and lumber.

The following table shows the values of some of the principal articles which made up United States trade with México in 1902:

IMPORTS.

Cattle	$768,164
Chicle	419,243
Vanilla beans	390,344
Coffee	2,836,614
Copper ore	9,934,097
Copper pigs, bars, ingots, etc	3,716,749
Sisal grass or henequén	11,609,087
Other unmanufactured vegetable fibers	582,466
Hides and skins	3,489,647
Lead in ore and base bullion	3,622,036
Mahogany	445,374

EXPORTS.

Agricultural implements	230,324
Cattle	225,138
Breadstuffs	1,722,915
Cars, carriages, etc	1,220,189
Chemicals, dyes, etc	1,088,547

Coal and coke	$2,687,169
Copper ore	699,677
Unmanufactured cotton	1,275,200
Cotton manufactures	661,721
Glass and glassware	379,105
Gunpowder and other explosives	979,233
Leather, and manufactures of	818,212
Iron and steel manufactures:	
Builders' hardware	685,025
Sewing machines	356,434
Machinery	7,094,112
Steam engines	918,222
All other	5,129,157
Mineral oils	760,202
Vegetable oils	1,143,020
Lard	702,082
Timber	648,416
Lumber	2,000,119
Wood manufactures	1,073,677

The United States Treasury Bureau of Statistics has published a table showing the rapid growth in United States exports to México in the fifteen years from 1887 to 1901, a result due to the increased facilities for transportation since the opening of the Mexican Central and Mexican National railways. Till then the trade of México was carried on by British houses, but now the British trade is conducted by a few agencies, which, by means of samples and catalogues, procure orders for goods, for there is in México to-day no important British commercial establishment. For the fifteen years, the exports of merchandise from the United States, United Kingdom, France, Germany, and Spain were as follows (in millions of dollars):

Year.	United States.	United Kingdom.	France.	Germany.	Spain.
1887	7.9	5.8	7.6	1.1	1.3
1888	9.9	5.7	8.5	1.6	1.3
1889	11.5	7.9	10.8	3.5	1.6
1890	13.2	9.8	10.7	3.5	1.8
1891	14.9	9.5	8.8	3.4	1.5
1892	14.3	7.2	6.8	2.9	1.4
1893	19.6	6.1	5.4	2.9	1.3
1894	12.8	6.4	5.8	2.7	1.3
1895	15.0	8.1	7.5	4.0	1.5
1896	19.5	8.2	6.4	3.7	1.7
1897	23.4	8.4	5.1	4.3	1.5
1898	21.2	9.3	5.8	4.9	2.1
1899	25.5	10.7	.1	5.4	2.9
1900	34.9	10.5	.....	.....	.....
1901	36.5	.....	.....	.....	.....

Figures for 1902 and 1903 are 39.8 and 42.2, respectively, for the United States.

Exports from México to the United States declared through the United States consulate-general in México City and five of the consular agencies—Guadalajara, Guanajuato, Oaxaca, Puebla, and Zaca-

tecas—subordinate to it, show that during the fiscal year ending June 30, 1903, such exports amounted to the following figures in gold:

City of México	$2,895,860.55
Guadalajara	145,296.48
Guanajuato	132,460.51
Oaxaca	200,404.70
Puebla	511,274.95
Zacatecas	316,963.42
Total	4,202,260.61

The principal articles were, in round numbers: Gold bullion, $2,334,600; silver bullion, $348,160; gold dust, $4,250; silver ore, $142,000; lead ore, $43,450; gold ore, $10,000; coffee, $87,000; broom root or zacatón, $38,000; hides, wet salted, $184,000; other hides, $4,500; skins of all kinds, $742,400; antique furniture, $5,000; linloe essence, $10,100; pearls, $10,000; onyx, $12,000; hats (palm), $49,200; hats (straw), $3,000; vanilla, $3,200; chile, $6,000; and garlic, $4,700.

Iron and steel imports.—The following table covers México's importations of iron and steel for building purposes during the years noted:

Fiscal year.	Iron and steel for building purposes.	Machines and apparatus.	Fiscal year.	Iron and steel for building purposes.	Machines and apparatus.
1893–94	$1,250,582	$3,399,331	1898–99	$2,258,685	$7,733,407
1894–95	1,543,451	3,574,507	1899–1900	4,150,704	9,532,270
1895–96	2,015,769	4,942,920	1900–1901	3,697,372	9,124,751
1896–97	2,066,387	4,347,428	1901–2	3,946,888	8,095,502
1897–98	2,203,199	6,039,476			

The importations of machines and apparatus in the fiscal year 1902–3 amounted to $7,431,871, against $5,594,513 for a like period in 1902.

COAL TRADE.

The British consul at Veracruz reports to the British Foreign Office on the coal trade of his consular district, which includes the ports of Veracruz, Tuxpam, and Coatzacoalcos in the State of Veracruz, Frontera in the State of Tabasco, Laguna de Términos and Campeche in the State of Campeche, and Progreso in the State of Yucatán. This report is published in the Board of Trade Journal of Great Britain of January 22, 1903, and says in part as follows:

"With the exception of Veracruz, Coatzacoalcos, and Progreso, the importations of coal through the ports mentioned may be considered as nil, as the entire trade would not amount to more than 1,000 tons in the course of a year.

"*Veracruz.*—The quantity of coal arriving at the port of Veracruz during the first six months of 1902 amounted in all to 104,807 tons, the principal part of this supply being drawn from the United States, the figures being 70,774 tons from that country, 34,025 from Great Britain, and a trifling quantity from Belgium.

COATZACOALCOS HARBOR, TEHUANTEPEC ISTHMUS.

"The coal from the United States was drawn for the most part from the State of West Virginia, whereas the stocks received from Great Britain consisted entirely of briquets, or patent fuel, shipped from Cardiff and district, and were for the use of the Mexican Railway Company. The average rate for charters at Veracruz is from 200 to 400 tons delivery per day, Sundays and holidays excepted. The current rate of stevedoring is 35 cents per ton (Mexican currency) for patent fuel, and for ordinary coal 45 cents.

"The average selling price of coal during the period under review was from $11.50 to $13 per ton f. o. b. railway companies' cars. From this must be deducted $1.75 for dock dues and other charges, which, calculated at the average rate of exchange during the six months of the present year, left a net price to the importer of from 18s. to 21s. Owing to the closing of a large number of mines in the United States, due to the coal strike, sterling prices advanced considerably.

"*Progreso.*—The average amount of coal consumed at the port of Progreso ranges from 800 to 1,000 tons per month, and is practically all of United States origin. The average price for coal ranged from $20 to $22 currency. This high price is mainly due to the fact that ocean rates rule much higher to Progreso than to Veracruz, principally owing to the facilities for discharging vessels being of the most indifferent manner.

"*Coatzacoalcos.*—The importations of coal have been limited to some few thousand tons introduced for the use of the National Railway of Tehuantepec and the harbor improvements being carried out at the two terminals of this line, Salina Cruz and Coatzacoalcos, respectively. Now that the railway has been repaired and put into such condition that the handling of public merchandise can be effected, the estimated coal consumption in order to meet the requirements of dredges, railway and coast steamers, connected with same, will probably amount to about 3,000 tons per month and upward."

Tampico.—The coal and coke imported into Tampico during the fiscal year ended June 30, 1903, according to figures forwarded by United States Consul Magill, at Tampico, to the Department of Commerce and Labor of the United States, was as follows:

	Tons.	Tons.
Coal:		
United States	280,906	
English	31,620	
Total		312,526
Coke:		
German	142,494	
United States	29,860	
English	5,216	
Total		177,570
Total coal and coke		490,096

The greater part of the United States coal was from Pensacola, Fla., under contract for the Mexican Central Railway, and was furnished by the Louisville and Nashville Railroad, which has excellent facilities for loading coal into vessels at Pensacola. The German coke was from Westphalia, Germany, and was shipped from the ports of Amsterdam, Rotterdam, and Antwerp.

A new dock for the discharge of coal and coke, under construction by the Mexican Central Railway, is to be provided with modern machinery for quick discharge of coal cargoes.

Paper trade.—The Norwegian consul-general in México, reporting on the paper trade of the Republic, states that Norwegian goods are recognized as the best that are imported into México. Straw pulp is imported, as well as bleached sulphite pulp. Mechanical pulp is scarcely consumed. The material is imported to México free of duty, provided it is perforated, the holes being 10 centimeters from each other in all directions. Wood pulp (chemical as well as mechanical) must be shipped thoroughly dry in order to be salable. The pulp is forwarded in rolls or bales of 100 kilograms. The packing consists of coarse linen cloth, paper, or thick wrapping paper fastened by iron hoops or steel wire. Tying by means of cord is considered objectionable. Low and medium grades of wrapping paper are manufactured in México, where the raw material is partly imported from abroad. Gray and blue wrapping paper for sugar packing is sold from 10 to 25 cents (Mexican currency) per kilogram; manila paper in rolls or reams, from 25 to 35 cents per kilogram.

Cheap cellulose and chemical pulp paper are imported from Norway. The prices range from 80 cents to $1 per ream. Cheap manila paper is imported from the United States and is quoted at 2¼ cents (gold) per pound. Better grades are imported, but in lesser quantities. The duty is 6 cents per kilogram (legal weight). Tissue papers formerly were chiefly imported from England, but the cheaper grade that is now imported from Germany has diminished the English imports. There is no considerable business in this article. The quotations vary, the color being the foundation for their fixation. Assorted tissue papers are sold in very great quantities in México. Each firm has a different assortment. The duty is 10 cents per kilogram (legal weight).

Envelopes come chiefly from the United States and Germany. English goods are of very fair and elegant quality, but during recent years the Mexican manufactories have made good progress in the making of envelope papers, and the home goods compete strongly with the foreign. The duty is 25 cents per kilogram (legal weight).

PORTS AND CUSTOMS DISTRICTS.

The ports of México open to foreign commerce are divided into Gulf and Pacific ports, as follows:

Gulf ports.—Campeche, Coatzacoalcos, Chetumal, Frontera, Isla del

Carmen, Isla de Mujeres, Progreso, Puerto Morelos, Tampico, Túxpam, and Veracruz.

Pacific ports.—Acapulco, Altata, Bahia de la Magdalena, Guaymas, La Paz, Manzanillo, Mazatlán, Puerto Angel, Salina Cruz, San Blas, San José del Cabo, Santa Rosalía, Todos Santos, and Tonalá.

The ports through which the coast trade is carried on on the Gulf side are Alvarado, Campeche, Celestún, Coatzacoalcos, Champotón, Chetumal, Frontera, Isla Aguada, Isla del Carmen, Nautla, Palizada, Progreso, Puerto Morelos, Tampico, Tecolutla, Tlacotálpam, Túxpam, and Veracruz; and on the Pacific side, Acapulco, Agiabampo, Altata, Bahía de la Magdalena, Chacagua, Guaymas, Isla del Carmen, Isla Maria Madre, La Paz, Las Peñas, Loreto, Manzanillo, Mazatlán, Mulejé, Perihuete, Puerto Angel, Salina Cruz, San Blas, San José del Cabo, San Quintin, Todos Santos, Santa Rosalía, Santo Domingo, Soconusco, Teconapa, Tonalá, Topolobampo, and Zihuatanejo.

The frontier custom-houses are Ciudad Juarez, Ciudad Porfirio Diaz, Laredo, and Nogales.

By a decree of March 31, 1903, a new custom-house was established at a point called Las Vacas, on the Rio Grande frontier and within the limits of the State of Coahuila. It is known as the "Aduana Fronteriza de Las Vacas," the jurisdiction of which commences at a point 25 kilometers north from Colombia, in Nuevo Leon, and continues for 25 kilometers north of Las Vacas, where the jurisdiction of the Ciudad Porfirio Diaz custom-house ends.

The domestic trade of the Republic is carried on mainly by means of the railways and coastwise vessels, while the foreign trade with the United States is maintained by railroads and ocean steamers, and with the other nations of the world by steam and sailing vessels.

The "Boletín de Estadística Fiscal" for 1901–2 estimates the foreign trade movement as follows:

The number of incoming vessels direct from abroad, at the Gulf ports and Pacific ports, was 906 steamers with a cargo of 906,999 metric tons of 1,000 kilograms, and 553 sailing vessels with a cargo of 187,701 metric tons, or a total of 1,459 vessels with a total cargo of 1,094,700 metric tons, divided as follows: Gulf ports, 671 steamers and 420 sailing vessels; and Pacific ports, 235 steamers and 133 sail; 1,091 vessels for the Gulf and 368 for the Pacific ports, under the flags of the following nationalities: German, 92; American, 420; English, 483; Norwegian, 304; French, 14; Spanish, 68; Cuban, 9; Mexican, 14; Russian, 9; Chilean, 18; Italian, 7; Danish, 9; Uruguayan, 1; Dutch, 6; Swedish, 5, sailing from the following countries: United States, England, Germany, Belgium, Brazil, Colombia, Cuba, Spain, France, and from other countries.

The outgoing foreign direct trade was carried in 1,423 vessels, with a total cargo of 312,557 metric tons, the Gulf ports being credited with

1,064 vessels, the cargo of which amounted to 305,429 metric tons, and the Pacific ports with 359 vessels, and a total cargo of 7,128 metric tons. The principal nationalities of the vessels were as follows: English, 466; American, 404; Norwegian, 309; German, 89; French, 14; Spanish, 67; Chilean, 19, and Cuban, 11; their destination being, the United States, England, Colombia, Spain, Germany, Cuba, France, Chile, and others going to Belgium, Costa Rica, Guatemala, Haiti, Holland, Italy, Russia, and Salvador.

The indirect foreign trade was as follows, 955 incoming vessels with 178,811 metric tons of merchandise, and 708 outgoing vessels with 89,418 metric tons, of which 544 were from the United States and 448 to that country, from and to Colombia, to Germany, England, France, Italy, Belgium, and other countries.

Internal trade was represented by 7,106 incoming vessels with a total cargo of 208,000 metric tons, and 7,180 outgoing vessels with 193,188 metric tons cargo. This trade was carried on through 18 Gulf and 27 Pacific ports, the incoming vessels engaged comprising 6,358 Mexican, 323 American, and 274 English, while the outgoing vessels comprised 6,337 Mexican, 366 American, and 315 English.

The total navigation for 1901–2 was as follows:

	Steamers.		Sail vessels.	
	Number.	Tonnage	Number.	Tonnage.
Incoming	5,700	1,235,254	3,820	246,257
Outgoing	5,497	479,195	3,814	115,968
Total	11,197	1,714,449	7,634	362,225

The total tonnage was:

	Steamers.	Sail vessels.	Total.
Imports	1,080,537	192,974	1,273,511
Exports	333,744	68,231	401,975
Coastwise	300,168	101,020	401,188
Total	1,714,449	362,225	2,076,674

A résumé of the freight carried on the railways of the northern frontier, in the trade between México and the United States, shows the following:

Frontier custom-houses.	Imports.		Exports.		Total.	
	Number of cars.	Tons.	Number of cars.	Tons.	Number of cars.	Tons.
Ciudad Juarez	7,729	123,664	2,506	40,276	10,235	163,940
Porfirio Diaz	9,182	138,371	8,386	23,236	17,568	161,607
Laredo	18,138	228,800	1,304	15,749	19,442	244,549
Nogales	2,258	26,914	1,934	30,015	4,192	56,929
Total	37,307	517,749	14,130	109,276	51,437	627,025

The custom-house receipts growing out of this trade show an increase of $291,696.78, as compared with the corresponding period of the preceding year, as follows:

	1900-1901.	1901-2.
Import duties	$26,255,087.89	$26,391,048.78
Export duties	779,819.39	863,855.71
All other dues	1,070,967.98	1,142,667.55
Total	28,105,875.26	28,397,572.04

TARIFF.

The tariff law now in force in México was promulgated on June 12, 1891, and went into effect on November 1, following, several amendments having since been made. A synopsis of the General Regulations of the Tariff Law of the Mexican United States (Tarifa de la Ordenanza General de Aduanas de los Estados Unidos Mexicanos), in so far as it treats of the obligations of shippers, passengers, etc., is given below.[a] The import tariff contains over 900 different articles, divided into general heads, these again being subdivided into classes. The latest modifications and amplifications, under date of February 4, 1904, have been published by the International Union of American Republics,[b] together with the official explanatory notes which both facilitate the clear understanding of the subject and fix more exactly the character of the merchandise coming under the several classifications. The following notes are of interest and self-explanatory:

"*Note 153.*—By '*tissues of smooth texture*' must be understood tissues composed of single thread, in which the woof threads, in crossing from one side to the other, pass above the pair threads and below the odd threads of the warp one by one, said threads crossing each other in a contrary direction to return to the point of departure—that is to say, passing above the odd threads and below the pair threads.

"Tissues obtained by any other process of weaving, as well as those woven in the above manner, but which, instead of being composed of a single thread, comprise either two or more parallel threads, entwining at the same time the woof or warp threads, or threads of several ends, shall not be considered as tissues of smooth texture.

"Open-work tissues, or drawn work, either of cotton or linen, shall not be considered tissues of smooth texture.

"To ascertain the number of threads composing a tissue of smooth texture, a lens shall be used known by the name of 'thread counter,' having a space of one centimeter side. The warp and woof threads

[a] The International Bureau of the American Republics will furnish any further information in this regard upon application.

[b] Monthly Bulletin of the International Bureau of the American Republics, March, 1904, page 709.

found in this space are added together, ignoring fractions of threads, and if the total can be exactly divided by two, the quotient shall be considered as the number of threads that the tissue contains in a half square centimeter per side; but if the sum is not exactly divisible by two, the fraction of a thread resulting in the quotient shall be considered as an entire thread and added as a unit to those obtained in the quotient. In this operation care should be taken that the edge of the square or space to be examined by the thread counter corresponds as nearly as possible with the space separating one thread from another.

"No account shall be taken of a difference of two or three threads when, in any part whatever of the tissue, the number of threads tallies with the declaration of the importer.

"*Note 322.*—This section includes machinery and apparatuses of all kinds not specified, moved by motive power, windlass, pedal, or lever, provided they are intended for use in agriculture, mining, industries, or arts.

"By machinery is understood a collection of pieces or parts for generating or transmitting power, or for performing any other operation, operating always by regular movements and periods.

"The machinery or apparatuses which are not intended for the industries, agriculture, mining, or the arts are not included in this section, and are dutiable according to their material and kind. In this class are included typewriters and adding machines, and, in general, all apparatuses and small machines for domestic use.

"Mechanical tools, provided always they operate with regular and periodic movements, are embraced in this section. Those which are not covered by these conditions pay the quota provided for in section 793.

"Loose parts and pieces of machines, included in section 800, are all those which can not be put to other uses, inasmuch as those which are capable of being employed for other purposes shall pay duty in conformity with the tariff according to material and class or kind."

Shipping regulations.—The following are the principal regulations governing the shipping of merchandise:

I. Shippers of goods to Mexican ports must supply an invoice of the goods shipped, even when such goods are for the public service of the Nation, or the States, owing to a special concession, or are free from import duties. Separate invoices, in triplicate or quadruplicate, as the law may require, must be made out for each consignee.

II. Shippers of goods may include in one package several bales, boxes, mats, rolls, or any other container inclosing goods of a like nature, provided the consular invoice expresses the number of packages contained in each outer covering, bale, or box. Should this not be done, or the failure not corrected within ninety-six hours after the entry of the vessel at the receiving custom-house, a fine not exceeding $50 will be imposed.

From this rule are excepted:

First. Heavy goods, which are usually tied together, such as iron and steel bars, pipes, metal sheets, boards for packing boxes and roofs, buckets and pails of wood or metal, parts of machinery, all similar goods, and free articles.

Second. Cans or immediate wrappings or containers of goods packed in each package.

Third. Piece goods in bales or cases; bottles, jars, or flasks containing elementary substances, drugs, perfumery, etc.; and, in general, small parcels, bags, boxes, or any other kind of packages put up in a strong outer container.

III. Consular invoices must declare separately the gross, net, and legal[a] weights, as the law may require, of packages which, while of the same article, come in different parcels.

Packages containing cotton, linen, wool or silk textures, or goods may be declared collectively with their joint weights or measures in case the goods are of a like tariff class, and their difference in weight does not exceed 10 kilograms.

Any infraction of this provision is punishable by a fine of $50, though the consignee is allowed until the inspector is named to dispatch the goods in which to correct errors.

IV. Interlineations, scratchings, erasures, or corrections causing a want of uniformity in the several copies of a consular invoice are prohibited. Should the want of uniformity affect elements essential to the determination of the duties, the latter will be regulated by the declaration "carrying the highest rate among the disagreeing invoices."

Such faults are tolerated in the cases following:

First. When they have been rectified by written explanations on the margin of the documents before taking out the consular certificate.

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[a] By *net weight* is understood the real weight of the merchandise, without the immediate coverings (*almas*), packages, or wrappings.

By *legal weight* is understood the weight of the goods, including only the immediate coverings, wrappings, vessel, cardboard, wood, or tin in which they may come inside of the outer box, which serves as the general receptacle. When goods taxed on the legal weight have no immediate covering, but come loose in an outside box, the intrinsic weight of the goods shall be considered the legal weight. In ascertaining the legal weight no account must be taken of the straw or shavings with which the packages may be packed in the outside case, nor of the weight of the latter.

By *gross weight* is understood the weight of the merchandise with all its cases and wrappings inside and outside, without allowance for fillings, nettings, or hoops. When a package contains several articles taxed on the gross weight, the custom-house will apportion the tax among them according to their respective legal weights. Articles taxed on the gross weight shall pay on the total weight of the merchandise when they come without wrappings or packings, or contained in cases which are accessible.

When fabrics having fringes are dutiable on the square meter, the measurement shall include such fringes. If they are dutiable according to weight, the weight must include that of the fringes.

Second. When, notwithstanding the corrections, the several copies of the same document agree.

Third. When the interlineations, erasures, etc., relate to points having no bearing upon the question of duties.

V. When the same package contains goods paying different duties, including some paying on the gross weight, shippers must declare in the invoice, aside from the total weight of the package, the legal weight of each article contained therein, in order to arrive at the proper distribution of the gross weight. The declaring of the legal weight must be done without prejudice to the legal weight, piece, pair, thousand, or measures of the other goods not taxed on the gross weight.

VI. Invoices of packages containing only samples do not need consular certification. The invoices need only declare the vessel on which they are shipped, name of consignee, port of destination, mark, number, quantity, and class of packages, gross weight of each, and generic designation of the kind of samples.

Failure to comply with the foregoing will incur a fine not exceeding $5 for each package.

VII. Shippers of goods must present for certification, before the sailing of the vessel, four copies of each invoice to the Mexican consul, consular or commercial agent residing in the place of shipment or in the port where the vessel is loading. Three copies must be left in the consulate, and the copy with certificate and receipt attached, which the Mexican official will deliver, is to be retained. This copy with the consular receipt attached shippers must transmit to the consignees of the goods.

VIII. In localities where there is no Mexican consul or consular agent, shippers will only make out invoices in triplicate, conforming otherwise with the foregoing provisions, transmitting on the same day, by registered mail, one copy to the Department of the Treasury and another to the collector of customs at the port of destination.

Shippers must require from the postmaster the necessary receipts, which must be forwarded to the consignee at the port of destination. There is no deviation from this requirement, and in default of an invoice with consular certificate or registered mail receipt, which must be presented by the consignee at the custom-house, is punishable by a fine in double the amount of duties on the goods imported.

IX. Invoices should be written in Spanish; but they will be admitted if written in any other well-known tongue when shippers are unacquainted with the official language of the Republic.

X. Consignees of imported merchandise are responsible before the law for any infractions of the regulations by the carriers or shippers thereof.

XI. Packages should have only one mark and number. Should

packages have marks or numbers other than those shown by the consular invoice and manifest the consignee will be fined $1 for each package so marked or numbered. Firm names or factory addresses uniformly stamped on packages will not be considered as violative of this regulation, provided such initials, figures, and numbers are those by which each package may be distinguished from the rest.

XII. Live stock[a] shipments to México must be governed by the provisions following:

First. The shipper must appear before the Mexican consul stationed at the point from which the shipment is to be made expressing his intention to make the same.

Second. The consul must secure a veterinary expert who, at the expense of the shipper, must examine the live stock in question and issue the proper health certificate.

Third. This certificate will be *visćed* by the said consul and should accompany the consular invoice to be presented at the custom-house of entry.

Fourth. On the live stock being entered at the custom-house the collector will designate an expert veterinary to examine the stock at the expense of the shipper and issue his certificate.

Sixth. If the stock is in a healthy condition it will be dispatched and delivered. If, on the other hand, it is diseased and the form of ailment is sufficiently proved the collector will decline to dispatch the stock and will notify the proper authority in order that the stock may be immediately sent out of the country, in which case no duties will be levied.

XIII. Fresh-meat shipments to México will be regulated by the same provisions as apply to live-stock importations save that the veterinary expert must examine the beeves before and after killing, and the meat must be shipped in refrigerators or so preserved physically or chemically that there will be no change in its condition. The meats on their introduction are subject to inspection by the Board of Health, at the expense of the importer.

Small shipments of fresh meat intended for the frontier settlements need not be shipped in refrigerators or otherwise preserved, should the collectors of customs deem it unnecessary.

XIV. For the certification of the documents which masters of vessels and shippers of goods must present, consuls will charge as follows:

1. For certifying ship's manifest conveying goods to the Republic	$10.00
2. For certifying manifest of ship in ballast	4.00
3. For certifying each set of invoices:	
If the value of the goods declared in the invoice does not exceed $100	1.00
If the value exceeds $100, but not $1,000	4.00
For every excess of $500 or fraction thereof	1.00

[a] Horses, sheep, goats, mules, and asses pay duty per head; cattle and hogs by weight.

4. For certificates of any kind to masters or shippers	$2.00
5. When said last-named certificates are requested in duplicate, triplicate, etc., for each extra copy	1.00
6. For certifying to errors in invoices, each set	2.00
7. For certifying to each set of permits to import through frontier custom-houses	.25

Consuls or consular agents before issuing the certificate will require the affirmation or oath, according to the law of the country where made, of the manufacturer or seller to the effect that the value given the goods in the invoice is the true value. This oath must be subscribed on the margin of a copy of the invoice of sale.

XV. Samples intended to make known the goods they represent are entitled to certain privileges, as follows:

Pieces of cloth fabrics not exceeding 20 centimeters (7⅞ inches) in length, and which may include the whole width of the cloth, and all articles which by reason of not being complete are useless for sale are admitted free.

Samples of complete articles, such as manufactures of any kind, hardware, dry goods, handkerchiefs, shawls, hoisery, shirts, etc., must either pay the corresponding duties or be rendered unsalable by cuttings or perforations.

When dry goods or hardware sample cases contain complete articles paying different duties, and the weight of each class can not be determined, the whole case will pay the rate attachable to the highest duty-paying article contained therein.

Samples of complete articles an importer may be interested in preserving for reexporting may be admitted duty free, provided the collector is satisfied he can identify the articles when exported; but the collector will require a bond in double the amount of the duties, giving the party in interest up to six months time within which to reexport the articles through the same custom-house.

If the interested party shall present himself within the time mentioned to pay the duties corresponding to the articles, they will be received; but if these are not reexported within said term the bond will be forfeited.

The owner of samples desiring to export them through a custom-house other than that of entry must secure the permission of the Department of the Treasury.

XVI. Passengers landing at Mexican ports must show their baggage to the custom-house officer having its inspection in charge, and should they bring small quantities of articles for gifts or personal use which are dutiable they must make the fact known to the officer before the baggage is opened.

XVII. Passengers bringing with them, either in their baggage or separately, merchandise the duties on which exceed $100 are bound to declare them in a consular invoice, conforming to the regulations for

imports of merchandise. All articles which because of their class or quantity are not deemed to be of personal use are considered as merchandise.

XVIII. The following are considered as passengers' baggage and are duty free:

First. Personal apparel, if not excessive, the collectors being judges of the amount in view of the passengers' circumstances.

Second. Articles worn or of personal use, such as jewelry, watch, chain, cane, etc., and one or two firearms, with their accessories and up to 100 cartridges.

Third. Instruments and tools the most necessary and indispensable for the exercise of a profession or trade, if the passengers are professors, artists, or artisans, in the understanding that pianos, organs, or barrel organs, and materials and accessories for the installation of laboratories, studios, or offices are excluded.

Fourth. Ninety-nine cigars, 40 packages of cigarettes, and half a kilogram of snuff or chewing tobacco, if the passengers are adults.

XIX. Should the passengers be artists of an opera, dramatic, circus, or other company, besides the foregoing articles they may introduce free the costumes and scenery which form part of their baggage, being bound to reexport the same within one year.

XX. Passengers bringing with them any household furniture will be allowed a rebate of duty corresponding to the depreciation of value in consequence of its use.

XXI. Should passengers declare that their baggage includes nothing but articles of personal use, and the inspection show that they bring dutiable merchandise, such merchandise shall pay double duties.

XXII. Most of the maritime custom-houses have warehouses attached, where goods may be left on deposit, which is limited to one month if the goods are perishable, or not longer than six months if otherwise. If not withdrawn within fifteen days after the expiration of the six months, the goods are sold at public auction.

Shippers should bear in mind that the weights and measurements of articles should be given in the metric system; that articles should be packed in cases or containers, according to the class of weight upon which duties are assessed—that is, goods upon which duties are charged on the gross weight should not be packed with goods paying by net or legal weight, or vice versa.

By treaty provisions between the United States and México, vessels of the former country are on the same footing in Mexican ports as Mexican vessels as regards tonnage, harbor, and light dues, pilotage,[a] salvage, and all local charges. The coasting trade is, however, reserved by either nation for its own vessels. United States vessels may import

[a] Pilotage is not obligatory under the laws of México.

into Mexican ports merchandise the growth or manufacture of the United States on the same terms as if they were imported in Mexican bottoms. The duties are to be no higher or other than those levied on similar merchandise the growth or manufacture of the most favored nation. In United States ports Mexican vessels and merchandise are accorded the same privileges enjoyed by American vessels and merchandise in Mexican ports.

Where there are no Mexican vessels to carry on the coastwise trade foreign sailing and steam vessels are permitted to engage in such trade. When the quantity of merchandise prepared for shipment from one port to another of the Republic is so small that it would not suffice to fill a Mexican vessel its shipment upon a foreign vessel is allowed.

On May 1, 1896, the Mexican Constitution was amended so as to abolish the *alcabala* or interstate customs duties, which it inherited from Spain, and which had for so many years acted as a stumbling block to the internal trade of the country.

New import duties.—The new import duties collected in the Republic are regulated by the following provisions contained in a decree bearing date of November 25, 1902:

On and after the 1st day of January, 1903, the laws of November 30, 1888, and May 12, 1896, creating respectively the 2 per cent port-works tax and the 7 per cent stamp tax on import duties shall be abolished. On and after the same date, import duties on foreign merchandise brought into the Republic shall continue to be adjusted in accordance with the rates set forth in the import schedule, but the sum payable according to that adjustment will be reduced by 50 per cent, and the amount thus found multiplied by the sum fixed by the department of Finance for the settlement of duties during the month in question, which in no case will be less than 220 per cent. The product represents the amount of import duties to be paid by the importer.

In order to determine every month the rate of settlement referred to, the Department of Finance will take the average of the rates at which the banks of México City have sold sight drafts on New York on each of the days comprised between the 1st and 25th of the month in which the announcement of the rate is to be made, making a reduction of 30 per cent, or less if the liabilities of the nation payable in foreign coin increase in future, on the difference between the fixed exchange rate of 220 per cent and the average in question. Said department, any day between the 25th and 28th of the respective month, shall inform the custom-houses, through the General Custom-House Bureau, of the rate adopted at which duties are to be settled during the following month, said rate being published in the 'Diario Oficial.'

The rate of settlement for import duties adopted for each month shall be applied to merchandise carried in ships anchoring in their ports

TAMPICO, STATE OF TAMAULIPAS.

of destination, or brought in over the frontiers after 12 o'clock on the night of the last day of the previous month and before the same hour of the last day of the current month, even though in either case the adjustment of clearance formalities be effected at a date subsequent to the last day of the month during which the rate of settlement was in force. Goods imported through the mails will be subject to the rate for the settlement of duties in force on the day of their arrival in the country.

The stamp tax payable by alcoholic beverages and foreign cards at the time of their importation, as well as the additional duty for the benefit of the municipalities of the towns where the custom-houses are situated, is estimated on the basis of the import duties calculated according to the foregoing rules. The fines provided by the General Custom-House Regulations to punish infringements of the ordinances are computed in the same manner when such penalties are based on a percentage of the import duties.

Merchandise imported for consumption in the Free Zone, with the exception provided by article 676 of the General Custom-House Regulations, shall pay only 10 per cent of the duties estimated as before stated, but the tax for the benefit of the municipalities, as well as the stamp tax payable by alcoholic beverages and foreign cards imported for use in said zone, is estimated and paid on the basis of the full duties.

Merchandise imported for the Free Zone and similar merchandise produced in that region and forwarded farther inland, according to the provisions of Section IV, Chapter XXII, of the General Custom-House Regulations, pay duties at the rate of liquidation in force at the date when permission for forwarding the goods is solicited, and from the total of said duties the 10 per cent above mentioned will be deducted, even though the merchandise may have been imported at any prior date. Duties on foreign goods shipped from point to point in the zone are estimated in the same manner, either to collect them according to law, or to impose the penalties provided for infringements of the law, as the case may be.

Another important decree went into effect on November 1, 1902, amending articles 468 and 469 of the General Customs Tariff, providing that the importation of small quantities of foreign merchandise intended for consumption in the frontier towns, and coming from places bordering on the Republic may be made through the passes or fords indicated by the custom-houses for international traffic, without the necessity of presenting a consular invoice or any other document, provided that the value of said merchandise shall not exceed $10.

Commercial travelers.—According to a special consular report issued by the Department of Commerce and Labor of the United States, traveling agents in México who confine their activity to the City of México,

or the surrounding Federal District, are free of all taxes. In the interior the tax imposed varies in accordance with the number of commodities handled by the agent. After the payment of this tax the agent is free to conduct business with merchants, as well as with private individuals. Samples possessing a value are subject to the regular duty, but when a declaration is made by the agent, in importing them, to the effect that it is his intention to reexport them within a certain time, the duty is refunded if such reexportation is made within the declared time.

FREE ZONE.

The Mexican Free Zone, according to an official description furnished by the Mexican authorities,[a] is as follows:

"There is understood by the term 'Free Zone' a strip of national territory which, covering all the northern frontier of the Republic in the States of Tamaulipas, Coahuila, Chihuahua, Sonora, and the Territory of Lower California, from the Gulf of México to the Pacific Ocean, extends in a latitudinal direction 20 kilometers (12.42 miles) from the frontier border toward the interior.

"It was established in the beginning from Matamoros to Monterey, Laredo (to-day Laredo of Tamaulipas) by Col. Ramón Guerra, governor of the State of Tamaulipas, by means of a decree dated the 17th of March, 1858, which was sanctioned by President Juarez the 30th of July, 1861.

"The tariff of the 1st of January, 1872, left it in existence, and the tariff of 1885 caused its extension to all the frontier. The general ordinance of custom-houses of 1887, as well as that of 1891, which is now in force, preserved it, although with modifications of importance, especially as regards collection of duties.

"The franchise granted the Free Zone consisted, in the beginning, in not levying any duty upon imported articles; afterwards, however, some small duties, purely local, were established, and the ordinance of 1887 established as a fixed basis 3 per cent on the value of the duties according to tariff—a basis which was raised to 10 per cent by the ordinance of 1891. By subsequent decrees the duties were raised 1½ per cent for the municipality and 7 per cent for stamps for internal revenue, the result of all this being that the merchandise introduced into the Free Zone from abroad now paid 18½ per cent upon the importation duties according to tariff.

"For the better comprehension of this explanation, there is here given an example of the duties paid by a certain article, according to its destination, either to the interior of the country or to the Free Zone.

"Let us suppose a bale of cotton weighs 100 kilograms (220.46

[a] Monthly Summary of Commerce and Finance of the United States, No. 12, series 1898–99, Bureau of Statistics, Treasury Department, 1899, p. 3182.

pounds). If destined for the interior of the country, it will pay duties as follows:

Description.	Duties.	
	Mexican currency.	United States currency.
100 kilograms (220.46 pounds), at 7 cents (3 cents)	$7.00	a$3.10
2 per cent for harbor works	.14	.06
1½ per cent (municipal)	.10	.04
7 per cent (revenue stamps)	.49	.22
Total	7.73	3.42

a The reductions in this report are made on the basis of the valuation of the Mexican dollar given April 1, 1898, by the Director of the United States Mint—i. e., $1 Mexican=44.4 cents.

"If that bale is destined to the Free Zone, it must pay—

Description.	Duties.	
	Mexican currency.	United States currency.
10 per cent on $7	$0.70	$0.30
1½ per cent on $7 (municipal)	.10	.05
7 per cent on $7 (stamps)	.49	.32
Total	1.29	.67

"If this same bale, after having been imported to the Free Zone, is shipped to the interior of the country, it must pay, in addition to the above—

Description.	Duties.	
	Mexican currency.	United States currency.
90 per cent on $7 ($3.10)	$6.30	2.79
2 per cent for harbor works	.14	.06
Total	6.44	2.85

which is equal to the amount charged for importation of the bale directly to the interior ($7.73=$3.42).

"It must be noticed that not all the merchandise that enters through the custom-houses of the north is destined for the Free Zone, and that much that is primarily imported for consumption there is afterwards shipped to the interior.

"The greater part of the merchandise that enters through Laredo, Tamaulipas, Porfirio Díaz (Eagle Pass), city of Juarez (El Paso, Tex.), and Nogales, Sonora, pays at once the entire duties and is forwarded immediately to the interior.

"The custom-house of Matamoros has little importation, and those of Guerrero, Camargo, Mier, Boquillas, Lasabe, Tiguana, and La Morita have practically none.

"The greater part of the goods imported by these last is consumed by the inhabitants of the towns named and their jurisdictions, and all are United States goods, such as hams, potatoes, lard, butter, beer, matches, coarse cloth material, etc.

"The principal cities found in the Free Zone are Matamoros, Camargo, Mier, Guerrero, Laredo City, Porfirio Díaz (Piedras Negras), City of Juarez (Paso del Norte), and Nogales. The others are small towns which have little commercial importance. The total population of the Free Zone could hardly be estimated to be 80,000 or 100,000 people.

"In the Free Zone there are no industries worth mentioning, nor is it possible to establish any, for the general ordinance of the custom-house permits the introduction to the interior of the country of industrial products manufactured in the Free Zone only on payment of the regular duties, which are equal to those levied on foreign goods of the same kind. Exportation to the United States of America would be difficult on account of its protective tariff, and the consumption in the Free Zone would not be sufficient to sustain industrial establishments of any importance, especially as not a single railroad exists, and transportation of merchandise is carried on in certain parts over difficult roads by means of the rudimentary system of ox carts."

CHAPTER XII.

FINANCIAL ORGANIZATION—PUBLIC DEBT—BUDGET.

The financial question in México has been one of the most perplexing problems that ever presented itself to the statesman's mind. From the moment the country emerged from its centuries of colonial rule it was confronted with the gravest economic difficulties. The tributary system, based upon monopoly and exclusive privileges, which had prevailed before the separation from Spain, could not be continued under the conditions obtaining among an emancipated and autonomic people. Without any previous experience, they were compelled to change, improvise, and try new systems. The many revolutions and consequent changes in the administrations served but to add to the perplexity of the situation, and it has required a high order of ability to bring the finances of the country to their present condition.

In 1823 the Mexican Government issued paper money, with results so deplorable that no administration has since ventured to repeat the experiment. The many difficulties which have beset the other American Republics through depreciated paper money have thus been avoided by México.

REVENUES.

The revenues of the Republic are divided into four groups or classes, which in 1901–2 yielded as follows:[a]

I. Foreign-commerce taxes.

Import duties	$26,391,048.78
Export duties	864,021.12
2 per cent for port improvements	523,085.84
Special port taxes	519,521.86
Sailing licenses	928.00
Pilots' and harbor masters' dues	16,698.94
Health office receipts	82,267.50
Consular dues	334,607.62
Consular and diplomatic certificates abroad	355.00
Total	28,732,534.66

[a] Boletín de Estadística Fiscal, año fiscal de 1901–2, No. 240.

II. Interior Federal taxes.

Stamp tax		$26,936,788.41
Embracing—		
Regular stamps	$9,956,698.93	
Federal tax	7,092,060.38	
7 per cent on imports	2,012,364.40	
Mining tax	1,275,714.02	
3 per cent on gold and silver	2,466,809.10	
Manufactured tobacco	1,603,088.09	
Spirits	864,722.83	
Cotton yarn and fabrics	1,578,788.65	
Miscellaneous, fines, etc	86,542.01	
Mintage dues and charges		1,435,467.18
Patent and trade-mark dues		33,480.00
Total		28,405,735.59

III. Interior, district and territorial taxes.

Direct taxes on real estate, professions, license tax, flour, and pulque	$3,235,904.17
Successions and donations	178,950.58
Other taxes	422.21
Total	3,413,276.96

IV. Public service and other sources.

Postal service	$2,367,957.22
Telegraph service	1,203,710.55
Lottery, fines, etc	2,023,833.74
Total	5,595,501.51

These figures show a grand total of $66,147,048.72 for the period under consideration.

A summary of the revenues of the Republic from 1897–98 to 1901–2 gives the following figures:

Group.	1897–98.	1898–99.	1899–1900.	1900–1901.	1901–2.
First	$23,284,989.17	$28,738,480.45	$29,945,793.04	$28,434,366.13	$28,732,534.66
Second	22,925,702.31	24,595,434.64	26,201,406.14	26,452,781.83	28,405,735.59
Third	2,794,458.41	2,958,555.01	3,280,630.91	3,281,976.02	3,413,276.96
Fourth	3,692,834.66	3,846,742.74	4,833,246.80	4,829,680.65	5,595,501.51
Total	52,697,984.55	60,139,212.84	64,261,076.89	62,998,804.63	66,147,048.72

The financial condition of the country in 1902–3 is shown in the following extracts from the report of the Secretary of Finance for México to the Federal Congress, under date December 14, 1903:

"The revenue account shows the following receipts from normal sources:

In cash	$76,023,416.11
In public debt securities	575,277.96
In nominal receipts	21,904.91
Total normal revenue	76,620,598.98

"The expenditure in cash under ordinary budget appropriations amounted, during the year 1902–3, to $68,222,522.20.

"A comparison between revenue and expenditure in cash on normal accounts shows the following results:

Revenue from normal sources	$76,023,416.11
Expenditure for normal purposes	68,222,522.20
Excess	7,800,893.91
Extraordinary receipts in cash [a]	1,212.00
Nominal receipts [b]	4,686,301.95
Total	4,687,513.95

"The following figures refer only to ordinary revenue and expenditure in cash, and also show the percentages which the annual surpluses bear to the ordinary expenditures of the several years:

Fiscal year.	Ordinary revenue in cash.	Ordinary expenditure in cash.	Excess of revenue.	Percentage.
1895–96	$50,521,470.42	$45,070,123.13	$5,451,347.29	12.11
1896–97	51,500,628.75	48,330,505.25	3,170,123.50	6.25
1897–98	52,697,984.55	51,815,285.66	882,698.89	1.70
1898–99	60,139,212.84	53,499,541.94	6,639,670.90	12.41
1899–1900	64,261,076.39	57,944,687.85	6,316,388.54	10.90
1900–1901	62,998,804.63	59,423,005.75	3,575,798.88	6.02
1901–2	66,147,048.72	63,081,513.73	3,065,534.99	4.86
1902–3	76,023,416.11	68,222,522.20	7,800,893.91	11.43

"The increase in ordinary receipts as compared with the previous year was $9,876,367.39, a substantial gain which no other year has equaled. The ordinary expenditures increased only by $5,141,008.47.

"The following table shows the comparison of estimates with ordinary receipts collected in 1902–3:

	Estimates of the Department of Finance accepted by the Budget Committee.	Collections effected.	Difference between estimates and collections.
Taxes on foreign commerce	$29,228,200.00	$34,784,080.55	+ $5,555,880.55
Interior taxes paid throughout the Federation	27,019,000.00	31,508,038.42	+ 4,489,038.42
Interior taxes paid in the Federal district and Territories	3,443,000.00	3,616,224.69	+ 173,224.69
Public services and minor sources	5,133,400.00	6,115,072.45	+ 981,672.45
Total	64,823,600.00	76,023,416.11	+ 11,199,816.11

"Among the sources of revenue of which the yield greatly surpassed the estimates are import duties, common stamps, stamps of the Federal tax, taxes on mining property, and on the precious metals. The reve-

[a] Payments made by persons who, on receiving from the treasury 5 per cent bonds without being entitled to the full coupon, have advanced money for the matured interest in order to receive said coupon.

[b] Receipts taken from the treasury reserves and included in the revenue account, as provided by various laws which appropriated a part of said reserves to certain works of public utility.

nue referred to is that collected in cash and from normal budget sources during the last five years, which was as follows:

	1898–99.	1899–1900.	1900–1901.	1901–2.	1902–3.
Taxes on foreign commerce.	$28,738,480.45	$29,945,793.04	$28,434,366.13	$28,732,534.66	$34,784,080.55
Interior taxes paid throughout the Federation	24,595,434.64	26,201,406.14	26,452,781.83	28,405,735.59	31,508,038.42
Interior taxes paid in the Federal district and Territories	2,958,555.01	3,280,630.91	3,281,976.02	3,413,276.96	3,616,224.69
Public services and minor sources	3,846,742.74	4,833,246.30	4,829,680.65	5,595,501.51	6,115,072.45
Total	60,139,212.84	64,261,076.39	62,988,804.63	66,147,048.72	76,023,416.11

INCREASE IN 1902-3 AS COMPARED WITH 1901-2.

Taxes on foreign commerce	$6,051,545.89
Interior taxes paid throughout the Federation	3,102,302.83
Interior taxes paid in the Federal district and Territories	202,947.73
Public services and minor sources	519,570.94
Total	9,876,367.39

"*Custom-house revenue.*—The revenue from this source is derived from import and export duties and the various forms of port and sanitary dues. On the other hand, the expenses of the service include those of the staff of the general custom-house bureau and of the fiscal gendarmerie.

"The proportion of expenses to collections has been as follows:

Fiscal year.	Collections.	Expenses.	Percentage.
1894–95	$19,681,679.32	$1,803,476.08	9.163
1895–96	23,433,088.36	1,823,286.27	7.780
1896–97	23,403,893.16	1,876,330.17	8.017
1897–98	23,047,021.72	1,941,421.20	8.423
1898–99	28,459,897.05	1,958,732.91	6.880
1899–1900	29,635,297.68	1,981,800.84	6.689
1900–1901	28,104,627.26	2,058,401.30	7.324
1901–2	28,397,572.04	2,130,446.47	7.502
1902–3	34,435,901.55	2,192,085.08	6.358

"*The stamp tax.*—For the computation of the cost of collection of this source of revenue all the amounts collected by the stamp offices, including the general administration, are taken into consideration.

"The comparative table since 1894–95 is as follows:

Fiscal year.	Collections.	Expenses.	Percentage.
1894–95	$15,553,989.50	$1,233,119.74	7.93
1895–96	18,066,480.46	1,317,375.13	7.29
1896–97	19,948,271.29	1,316,230.79	6.60
1897–98	21,621,246.13	1,403,536.49	6.49
1898–99	23,215,698.77	1,470,656.75	6.33
1899–1900	24,849,618.78	1,479,570.57	5.95
1900–1901	25,149,650.73	1,469,976.02	5.84
1901–2	26,961,933.28	1,551,194.24	5.75
1902–3	29,750,265.83	1,645,179.92	5.52

"The percentage of the cost of collection of this form of revenue as steadily decreased, owing to the fact that the yield of the tax has

constantly increased. The increase in expenditure was more than compensated by the increase in collections.

"*Revenue from direct taxation.*—The cost of collection of this branch of revenue is estimated on the basis of the total collections of the direct taxation office not only for the Federation but for each of the municipalities of the Federal District.

Fiscal year.	Collections.	Expenses.	Percentage.
1896-97	$3,378,545.98	$168,664.38	4.992
1897-98	3,534,324.96	172,770.68	4.888
1898-99	3,743,314.53	173,887.03	4.645
1899-1900	3,991,118.37	175,388.76	4.395
1900-1901	4,165,963.53	178,507.08	4.285
1901-2	4,396,829.91	188,035.45	4.277
1902-3	4,595,591.95	192,444.11	4.187

EXPENDITURES.

The expenditures for 1901–2 were as follows:

Legislative power	$1,191,149.42
Executive power	159,165.99
Judicial power	503,549.81
Department of Foreign Relations	1,019,080.34
Department of Government	4,909,918.72
Department of Justice and Public Instruction	3,134,159.13
Department of Promotion, Colonization, and Industry	968,788.64
Department of Communications and Public Works	9,366,331.45
Department of Treasury and Public Credit	27,603,622.05
Department of War and Navy	14,325,748.18
Total	63,081,513.73

This was the amount actually disbursed during the fiscal year in question, as there remained at the Treasury an unpaid balance of $229,741.47 for claims uncollected at the close of the fiscal year. The balance remaining to the credit of the Government at the end of 1901–2 was, therefore, as follows:

Revenues, as stated	$66,147,048.72
Net expenditures	62,851,772.26
Balance	3,295,276.46

Taking as a basis the year 1894–95, which was the first to show a surplus after the financial crisis of 1891, the following figures show, in round numbers, the state of the Treasury up to and including the year 1901–2:

Year.	Receipts.	Expenditures.	Surplus.
1894-95	$43,946,000	$41,372,000	$2,573,000
1895-96	50,521,000	45,070,000	5,454,000
1896-97	50,501,000	48,330,000	3,170,000
1897-98	52,698,000	51,815,000	883,000
1898-99	60,139,000	53,499,000	6,640,000
1899-1900	64,261,000	58,310,000	5,951,000
1900-1901	63,000,000	59,400,000	4,400,000
1901-2	66,000,000	63,000,000	3,000,000

For the year 1902–3 the expenditures were, according to the report above mentioned, as follows:

"The following tables for 1898–1903 show the increase in the total expenditure of each year as compared with the year immediately preceding, and the percentage of the disbursements effected on account of each division of the budget, as compared with the total disbursements for the year:

	1898–99.	Percentage.	1899–1900.	Percentage.	1900–1901.	Percentage.
Legislature	$972,435.73	1.818	$972,631.25	1.668	$981,210.72	1.651
Executive	74,249.42	.138	74,137.65	.127	122,004.28	.207
Judiciary	433,985.51	.812	443,774.01	.760	496,792.38	.836
Department of Foreign Relations	498,245.38	.933	530,857.17	.911	899,937.13	1.514
Department of the Interior	3,618,487.83	6.763	3,916,299.23	6.716	4,437,550.98	7.468
Department of Justice and Public Instruction	2,450,065.58	4.579	2,880,056.76	4.939	2,897,693.46	4.876
Department of Promotion, Colonization, and Industry	736,512.68	1.376	1,155,276.94	1.982	1,103,866.14	1.857
Department of Communications and Public Works	6,079,205.44	11.363	6,737,069.92	11.553	7,944,490.32	13.370
Department of Finance and Public Credit:						
Administrative services	6,392,784.39	11.949	6,586,140.32	11.295	6,601,315.30	11.109
Public debt	20,058,538.55	37.493	21,612,126.05	37.065	20,165,142.59	33.935
Department of War and Navy	12,185,031.43	22.776	13,401,964.38	22.984	13,773,002.45	23.177
Total	53,499,541.94	.....	58,309,933.68	.....	59,423,005.75	.....
Increase in total of disbursements effected as compared with year immediately preceding	.....	3.269	.....	8.9914	.....	1.908

	1901–2.	Percentage.	1902–3.	Percentage.
Legislature	$1,091,149.42	1.730	$1,103,911.23	1.618
Executive	159,165.99	.252	278,288.01	.409
Judiciary	503,549.81	.798	401,392.83	.586
Department of Foreign Relations	1,019,080.34	1.615	860,175.45	1.262
Department of the Interior	4,909,918.72	7.784	5,014,208.67	7.336
Department of Justice and Public Instruction	3,134,159.13	4.968	3,883,979.32	5.696
Department of Promotion, Colonization, and Industry	968,788.64	1.536	1,063,536.06	1.556
Department of Communications and Public Works	9,366,331.45	14.848	8,814,423.45	12.923
Department of Finance and Public Credit:				
Administrative services	7,036,665.13	11.155	7,520,241.95	11.029
Public debt	20,566,956.92	32.604	24,289,865.98	35.606
Department of War and Navy	14,325,748.18	22.710	14,992,499.25	21.979
Total	63,081,513.73	.....	68,222,522.20	.....
Increase in total of disbursements effected as compared with year immediately preceding	.....	6.1567	.....	7.585

"In the year under review the budget voted by the Chamber of Deputies amounted to $65,429,880.64; but this appropriation was increased during the course of the fiscal year to $7,499,207.31, by virtue of certain provisions contained in the budget itself.

"*Holdings in cash.*—At the termination of the fiscal year ending June 30, 1903, the Federal Government had in its vaults and in the hands of its agents or correspondents in cash the sum of $30,917,018.35.

"This sum compared with the holdings at the beginning of the fiscal year in question—on June 30, 1902—show the following increase:

Holdings in cash at the end of 1901–2 (gold and silver, not reckoning the premium on the gold)	$30,635,422.82
Holdings in cash at the end of 1902–3 (gold and silver, not reckoning the premium on the gold)	30,917,018.35
Increase	281,595.53

"The holdings were divided between gold and silver dollars as follows:

	Held on June 30—	
	1902.	1903.
Gold dollars	$4,401,539.97	$2,708,785.67
Silver dollars	26,233,882.85	28,208,232.68
Total	30,635,422.82	30,917,018.35

"In the course of the fiscal year 1902–3 the holdings in gold decreased by $1,692,754.30, and the holdings in silver increased by $1,974,349.83.

"BALANCE OF DEBTOR AND CREDITOR ACCOUNTS.

Total assets	$69,480,554.60
Total liabilities, the public debt excepted	25,232,943.89
Difference in favor of the nation	44,247,610.71

PUBLIC DEBT.

The public debt of México is represented by bonds of differing rates of interest and payable in gold or silver, according to designation.

According to Romero,[a] the history of the Mexican foreign debt begins in 1825, very soon after the independence of the country was established, when two loans were contracted in London, both for £10,000,000, the interest on which, owing to the disturbed conditions prevailing in the Republic, was not promptly paid, the bonds consequently falling to a low nominal price. In 1851, after the war with the United States, that debt was refunded into a new bond issue, the interest on which was reduced from 5 to 3 per cent. The internal affairs of the country not permitting the payment of the interest on these bonds, in 1888 a new adjustment was made, by which gold-bearing bonds at 6 per cent were issued, the interest on which has since been paid promptly, the bonds reaching par.

From 1849 to 1856 bonds were issued to pay claims of English, French, and Spanish subjects, under certain conventions, and such bonds were subsequently exchanged at differing rates for the 6 per cent gold bonds of the foreign debt.

[a] "Mexico and the United States," New York, 1898, p. 129.

In 1888 another loan was negotiated in London for £3,000,000, at 5 per cent, for the construction of the Tehuantepec Railroad. The subsidies granted to railway companies were payable in silver with a percentage of the import duties, but as they amounted to a considerable sum and were a heavy drain on the national treasury, the Government, in 1890, contracted another loan in London, on a gold basis, at 6 per cent interest, to be applied to the subsidies due most of the railway companies up to that date.

In 1850 a domestic or interior debt was contracted, covered by bonds bearing interest payable in silver at 3 and 5 per cent. There was, besides, other indebtedness of various kinds, growing out of loans and other obligations entered into at a time when the Government revenues were not sufficient for its expenditures. All these debts have been consolidated into new bonds, bearing interest at 3 and 5 per cent, payable in silver, and the railway subsidies remaining unpaid from the proceeds of the loan of 1890 have been met by bonds at 5 per cent, both interest and principal being paid in silver.

Romero[a] states that "it is very onerous to México, when it is on a silver basis, to pay in gold the interest of its foreign debt, because we have to buy gold at current prices, and it costs us now double its current price. When silver was about 50 cents on the dollar, as compared with gold, 6 per cent interest of our foreign debt cost us 12 per cent, and of course the further silver is depreciated the greater will be the cost of paying the interest of our gold debt." President Díaz gives, in his report of November 30, 1896, the following data about the cost to the Mexican treasury of buying exchange to place in London the funds to pay the gold interest on the foreign debt:

Fiscal year:	
1898–99	$729,178.17
1890–91	2,314,477.77
1891–92	3,225,246.77
1892–93	5,101,223.57

The total amount of the Mexican debt on the 30th of June, 1896, was $203,225,067.34, as follows:

Sterling Mexican debt	$114,675,895.49
Payable in silver	88,549,111.80

In 1896–97 a third division of the debt was introduced under the name of Floating Debt,[b] and which, at the close of the fiscal year named, stood as follows:

Debt payable in foreign coin at the rate of $5 per pound sterling	$108,865,528.00
Bonded debt payable in silver	91,951,573.21
Floating debt	1,473,696.70
Total	202,290,797.91

[a] Opus cit., p. 130.

[b] The floating debt consists of credits and other certificates not presented for conversion, uncollected interest and unpaid balances of previous estimates.

At the end of the fiscal years 1897–98, and 1898–99, the public debt, including uncollected interests, stood as follows:

	1897–98.	1898–99.
Foreign debt (gold)	$109,509,544.00	$108,945,064.00
Mexican debt (silver)	103,997,703.23	114,542,647.93
Floating debt	1,401,808.63	953,619.21
Total	214,809,055.86	224,441,351.14

At the end of the fiscal year 1901–2 the debt stood as follows:

Foreign debt (gold)	$113,513,980.50
Mexican debt (silver)	147,097,930.57
Floating debt	1,342,403.50
Total	261,954,314.57

The floating debt is a noninterest-bearing debt, while the Mexican bonded and the foreign debt are interest bearing. The debt proper—that is, not including the uncollected interest—for 1901–2 amounts to $259,409,153.50, as follows:

Foreign debt	$112,053,800.00
Mexican bonded	146,012,350.00
Floating debt	1,342,403.50

The debt payable in foreign gold is represented by the value it would attain should the foreign rate of exchange be at par, the supposed value of $5 per pound sterling being the most approximate valuation. The floating debt is made up of credits which the parties interested have not collected or converted into other bonds according to the laws governing the public debt. The Federal treasury has not among its floating debt a single "short-time" bond, either interest bearing or not, issued since July, 1894, in payment of any claims. As to the uncollected or unclaimed interest on either the gold or silver debt, the respective amounts are deposited in the banks and banking houses in charge of said debts, those of the silver debt being placed in the National Bank, and those of the gold bonds of 1888, 1890, and 1893 with the firm of S. Bleichroeder, of Berlin.

In June, 1899, negotiations were entered into, conducted by the Secretary of the Treasury in person, having for their object the conversion of the foreign gold debt, which culminated in the signing of a contract in Berlin, whereby J. P. Morgan & Co., of New York, J. S. Morgan & Co., of London, S. Bleichroeder, the Deutsche Bank, and the Dresden Bank of Berlin undertook the conversion of the entire foreign debt of the Republic of México, viz: Six per cent loans of 1888, 1890, and 1893, and the 5 per cent Tehuantepec loan, heretofore issued in London and Berlin, into a 5 per cent consolidated external gold loan due within forty-five years at par by semiannual drawings, which may be increased after the year 1909, the first one to take place

II. Interior Federal taxes.

Stamp tax		$26,936,788.41
Embracing—		
Regular stamps	$9,956,698.93	
Federal tax	7,092,060.38	
7 per cent on imports	2,012,364.40	
Mining tax	1,275,714.02	
3 per cent on gold and silver	2,466,809.10	
Manufactured tobacco	1,603,088.09	
Spirits	864,722.83	
Cotton yarn and fabrics	1,578,788.65	
Miscellaneous, fines, etc	86,542.01	
Mintage dues and charges		1,435,467.18
Patent and trade-mark dues		33,480.00
Total		28,405,735.59

III. Interior, district and territorial taxes.

Direct taxes on real estate, professions, license tax, flour, and pulque	$3,235,904.17
Successions and donations	178,950.58
Other taxes	422.21
Total	3,413,276.96

IV. Public service and other sources.

Postal service	$2,367,957.22
Telegraph service	1,203,710.55
Lottery, fines, etc	2,023,833.74
Total	5,595,501.51

These figures show a grand total of $66,147,048.72 for the period under consideration.

A summary of the revenues of the Republic from 1897–98 to 1901–2 gives the following figures:

Group.	1897–98.	1898–99.	1899–1900.	1900–1901.	1901–2.
First	$23,284,989.17	$28,738,480.45	$29,945,793.04	$28,434,366.13	$28,732,534.66
Second	22,925,702.31	24,595,434.64	26,201,406.14	26,452,781.83	28,405,735.59
Third	2,794,458.41	2,958,555.01	3,280,630.91	3,281,976.02	3,413,276.96
Fourth	3,692,834.66	3,846,742.74	4,833,246.30	4,829,680.65	5,595,501.51
Total	52,697,984.55	60,139,212.84	64,261,076.39	62,998,804.63	66,147,048.72

The financial condition of the country in 1902–3 is shown in the following extracts from the report of the Secretary of Finance for México to the Federal Congress, under date December 14, 1903:

"The revenue account shows the following receipts from normal sources:

In cash	$76,023,416.11
In public debt securities	575,277.96
In nominal receipts	21,904.91
Total normal revenue	76,620,598.98

"The expenditure in cash under ordinary budget appropriations amounted, during the year 1902–3, to $68,222,522.20.

"A comparison between revenue and expenditure in cash on normal accounts shows the following results:

Revenue from normal sources	$76,023,416.11
Expenditure for normal purposes	68,222,522.20
Excess	7,800,893.91
Extraordinary receipts in cash [a]	1,212.00
Nominal receipts [b]	4,686,301.95
Total	4,687,513.95

"The following figures refer only to ordinary revenue and expenditure in cash, and also show the percentages which the annual surpluses bear to the ordinary expenditures of the several years:

Fiscal year.	Ordinary revenue in cash.	Ordinary expenditure in cash.	Excess of revenue.	Percentage.
1895–96	$50,521,470.42	$45,070,123.13	$5,451,347.29	12.11
1896–97	51,500,628.75	48,330,505.25	3,170,123.50	6.25
1897–98	52,697,984.55	51,815,285.66	882,698.89	1.70
1898–99	60,139,212.84	53,499,541.94	6,639,670.90	12.41
1899–1900	64,261,076.39	57,944,687.85	6,316,388.54	10.90
1900–1901	62,998,804.63	59,423,005.75	3,575,798.88	6.02
1901–2	66,147,048.72	63,081,513.73	3,065,534.99	4.86
1902–3	76,023,416.11	68,222,522.20	7,800,893.91	11.43

"The increase in ordinary receipts as compared with the previous year was $9,876,367.39, a substantial gain which no other year has equaled. The ordinary expenditures increased only by $5,141,008.47.

"The following table shows the comparison of estimates with ordinary receipts collected in 1902–3:

	Estimates of the Department of Finance accepted by the Budget Committee.	Collections effected.	Difference between estimates and collections.
Taxes on foreign commerce	$29,228,200.00	$34,784,080.55	+ $5,555,880.55
Interior taxes paid throughout the Federation	27,019,000.00	31,508,038.42	+ 4,489,038.42
Interior taxes paid in the Federal district and Territories	3,443,000.00	3,616,224.69	+ 173,224.69
Public services and minor sources	5,133,400.00	6,115,072.45	+ 981,672.45
Total	64,823,600.00	76,023,416.11	+ 11,199,816.11

"Among the sources of revenue of which the yield greatly surpassed the estimates are import duties, common stamps, stamps of the Federal tax, taxes on mining property, and on the precious metals. The reve-

[a] Payments made by persons who, on receiving from the treasury 5 per cent bonds without being entitled to the full coupon, have advanced money for the matured interest in order to receive said coupon.

[b] Receipts taken from the treasury reserves and included in the revenue account, as provided by various laws which appropriated a part of said reserves to certain works of public utility.

Securities of the public debt that show a decrease on June 30, 1903, as compared with the same date in 1902—Continued.

	June 30, 1902.	June 30, 1903.	Decrease on June 30, 1903.
Noninterest-bearing debt (floating debt).			
Certificates of arrears, claims not presented for conversion, and outstanding budget balances	$1,342,403.50	$1,269,833.46	$72,570.04
Total	1,342,403.50	1,269,833.46	72,570.04

RÉSUMÉ.

Debt payable in foreign money	$739,800.00
Debt payable in silver money	736,250.00
Debt not bearing interest (floating debt)	72,570.04
Total	1,539,620.04

"The total amount of the debt redeemed in 1902–3 was $1,539,620.04, against $1,269,250, which was the amount redeemed in the preceding year.

"In the noninterest-bearing floating debt there has been a decrease of $72,570.04, owing to the redemption of certificates of arrears.

"*Increase of the debt.*—The following table shows the classes of the debt that increased and the amount of such increase, as compared with the preceding year:

Securities of the debt payable in silver (principal).	June 30, 1902.	June 30, 1903.	Increase in 1903.
Provisional certificates of bonds of the 5 per cent interior redeemable debt, fifth series	$5,294,100	$16,842,500	$11,548,400
Veracruz and Pacific Railway bonds	3,569,500	5,939,500	2,370,000
Total	8,863,600	22,782,000	13,918,400

"The increase in the debt, as in the given previous year, occurred in the following classes of securities only:

"Fifth series of bonds of the 5 per cent redeemable debt, and bonds of the Veracruz and Pacific Railway. The amount of both classes of securities issued during the year under review is considerable, particularly the amount of certificates of the fifth series of the 5 per cent redeemable debt, and both have entered into circulation by virtue of the respective contracts."

BUDGET.[a]

1903–4.—The budget for the fiscal year commencing July 1, 1903, and terminating June 30, 1904, as approved by the House of Deputies, amounts to $74,838,268.77 Mexican silver, distributed as follows:

Legislative	$1,155,801.20
Executive	267,300.86
Judicial	450,803.40
Foreign Relations	782,576.75

[a] See tables on pages 412–413, Chapter XIX.

Department of Interior:	
Personnel and expenses of the department	$3,173,549.70
Political and municipal government of the Federal District	5,731,203.55
Political and municipal government of the Federal territories	357,143.10
Department of Justice	968,969.70
Assistant Secretary of Public Instruction	3,123,598.03
Department of Public Works	1,145,718.30
Department of Communications	9,743,723.83
Treasury:	
Administration	7,681,740.65
Public debt	24,542,543.99
Department of War	15,713,595.71
Total	74,838,268.77

1904–5.—On December 14, 1903, the Mexican Secretary of the Treasury presented to the Federal Congress the budget for the fiscal year 1904–5, from which the following data are collected:

"The forecast of the revenue which will be collected in the coming fiscal year, and a minute examination of the expenses of all the services of the public administration during the same period of time, afford a basis for the presentation of the budget bill for the year in question, subject to the following showing:

Estimate of normal revenue	$79,965,000.00
Expenditure proposed	79,862,157.39
Excess of revenue over expenditure	102,842.61

"The recapitulation of the estimates of revenue during the fiscal year 1904–5 shows the following results:

Taxes on foreign commerce.

Import duties	$31,350,000
Export duties	862,000
Sundry port dues	650,000
Guard and storage dues	44,000
Pilotage dues	19,000
Sanitary dues	88,000
Consular fees	364,000
Other minor taxes on foreign commerce	1,000
Total taxes on foreign commerce	33,378,000

Interior taxes payable throughout the Federation.

Stamp revenues:	
Sales of common stamps	$12,000,000
Federal contribution	7,050,000
Taxes on mining property	1,840,000
Three per cent on gold and silver	2,980,000
Tax on tobacco	2,555,000
Tax on alcohol	1,250,000
Tax on cotton, yarn, and cloth	1,840,000
Trade-mark and patent dues	35,000
Sundry income under the stamp law	90,000
Total yield of the stamp revenue	29,640,000

Other Federal internal taxes:	
Taxes on coinage, assay, smelting, separation, and refinement	$1,860,000
Total interior taxes payable throughout the Federation	31,500,000
Taxes payable in the Federal District and territories.	
Direct taxes on real estate, business licenses, professional tax, taxes on flour and pulque, and in general all local taxes and receipts	$8,359,000
Successions and donations	200,000
Public registry of property	50,000
Total special taxes of the Federal District and territories	8,609,000
Public services.	
Earnings of post-office	$2,980,000
Earnings of telegraph office	1,555,000
Earnings of certain Government establishments	38,000
Total revenue from public services	4,573,000
Proceeds from the Nation's real estate.	
From sundry operations therein	$140,000
Profits and minor sources.	
National lottery	$360,000
Minor sources	1,405,000
Total lottery and minor sources	1,765,000
RÉSUMÉ.	
First group	$33,378,000
Second group	31,500,000
Third group	8,609,000
Fourth group	4,573,000
Fifth group	140,000
Sixth group	1,765,000
Total estimated revenue for 1904–5	79,965,000
Departmental appropriations for 1904–5	79,862,157

"A comparison between the departmental appropriations of the budget for 1903–4 and those of the proposed budget for 1904–5 shows the following differences:

Department.	Budget for 1903–4.	Budget for 1904–5.
Legislature	$1,155,801.20	$1,155,801.20
Executive	267,300.86	282,341.11
Judiciary	449,803.40	450,423.90
Department of Foreign Relations	783,489.25	778,034.14
Department of the Interior	9,261,774.35	11,112,816.98
Department of Justice	968,969.70	1,183,595.35
Public Instruction	3,135,598.43	3,520,050.56
Department of Fomento	1,145,718.30	1,586,105.65
Department of Communications and Public Works	9,743,723.83	10,089,605.21
Department of Finance and Public Credit:		
Administrative services	7,681,740.65	7,834,138.45
Public debt	24,542,543.99	25,236,043.99
Department of War and Navy	15,713,596.31	16,689,200.85
Total	74,850,060.27	79,862,157.89

EL ORO MINING WORKS, STATE OF MÉXICO.

CHAPTER XIII.

MINTS, CURRENCY, BANKS, BANKING LAWS—CORPORATIONS.

Since the enactment of the law of June 6, 1887, the production of gold and silver has greatly increased in the Republic, and it is due to this law that the latter metal has attained its present enormous output. The main objects of the law in reference were: The reduction of the cost of metal production; to relieve the mining industry as much as possible of the onerous taxes and obstacles which retarded its free development; to lower the cost of the principal raw materials required in the industry, and also to attract capital. Further legislation on June 6, 1892, gave a new impetus to mine production, the output of silver from 1886 to 1891 being valued at $199,208,204, while from 1891 to 1896 it aggregated $267,122,418. By the law of June 4, 1894, the executive was authorized to grant concessions under certain conditions to those engaged in the exploitation of gold mines, this industry having increased its production from $920,702 in 1890–91 to $4,744,542 in 1894–95, and to $6,054,078 in 1895–96. This calculation is made on the basis of $20 silver per ounce of gold, which is the standard used in the Mexican statistical tables. It is claimed that these figures do not cover the true production of the gold districts, as almost all the exports of this metal are shipped clandestinely.[a]

Mints were established in México in 1537, the custom being sometimes followed of renting them to private individuals, who collected a mintage charge of nearly 4½ per cent upon the amount of bullion coined. Until within eight years ago there were thirteen mints in the Republic, but as increased facilities of transportation have reduced the difficulties attendant upon the carriage of the bullion from mine to mint, this number has been decreased to three, one being in the City of México, one in Zacatecas, and one in Culiacán. Besides these mints there are Federal Assay Offices situated at Aguascalientes, Alamos, Chihuahua, Durango, El Paso (Texas), Guadalajara, Guanajuato, Hermosillo, Monterey, Oaxaca, San Luis Potosí, Tezuitlán, and Zacatecas.

[a] "Los Estados Unidos Mexicanos, etc.," Rafael de Zayas Enriquez, New York, p. 20.

Coinage.[a]—From colonial times to June 30, 1902, the total coinage of the Republic is represented by the following figures:

From—	Gold.	Silver.	Copper.	Total.
1537 to 1821	$68,778,411.00	$2,082,260,657.44	$542,893.37	$2,151,581,961.81
1822 to 1902	59,868,273.50	1,387,675,274.28	6,585,894.86	1,454,129,442.14
Total	128,646,684.50	3,469,935,931.72	7,128,787.73	3,605,711,403.95

During the presidency of Gen. Manuel Gonzalez nickel to the value of $4,000,000 was coined, but this was subsequently withdrawn from circulation. From December 1899 to June 30, 1902, bronze was coined to the value of $65,150, thus bringing the total coinage to $1,458,194,572.14, giving a yearly average of $9,876,269.64 since 1537.

During the fiscal year ending June 30, 1903, money was coined to the value of $27,200,534, as compared with a coinage of $25,315,332 during the fiscal year 1901–2, or an increase of $1,885,202 in 1902–3. The coinage during the fiscal year 1902–3 was as follows:

Silver	$26,438,350
Gold	713,146
Copper	49,038

According to statistics for the fiscal year 1902–3, silver coin was exported to the value of $21,098,339, and gold coin valued at $106,598, showing that of the coinage of the year referred to there remained in the country in circulation $5,340,011 in silver coins and $606,548 in gold coin.

The receipts of precious metals at the mints and Federal assay offices in 1901–2 were as follows:

	Gold.		Silver.		Total value.
	Kilos.	Value.	Kilos.	Value.	
Mints	4,875	$3,292,645	556,016	$22,749,397	$26,042,042
Assay offices	4,590	3,100,200	890,904	36,451,355	39,551,555
Total	9,465	6,392,845	1,446,920	59,200,752	65,593,597

The disposition of these metals was as follows:

	For coinage.	For export.	Total value.
Gold	$765,862	$5,626,982	$6,392,845
Silver	27,961,766	31,238,986	59,200,752
Total	28,727,628	36,865,968	65,593,597

Exports of specie.—In a report to the Mexican Monetary Commission the following information is found with regard to the annual

[a] See table on page 417, Chapter XIX.

export of silver dollars from the Republic, which is stated to be one of the most interesting phenomena in international currency problems.

"The average annual exportation of silver dollars is estimated at $15,000,000, though in 1902 it rose to $17,621,700. Out of the said amount barely 10 per cent of the pesos exported to London are melted down, while the balance of the London shipments and all those sent to the United States are reexported to India, the Straits Settlements, and the Chinese Empire. The pesos which reach India are melted down, whereas in other oriental countries to which they are shipped Mexican dollars are used as currency, though British dollars also circulate in the Straits Settlements and American dollars in the Philippines.

"In regard to the volume of the demand for Mexican dollars in the Far East in former times and the present demand for same, it is stated that the Spanish dollar coined in México during the seventeenth and eighteenth centuries and the Spanish dollar and Mexican dollar in the nineteenth century was, par excellence, the dollar of commerce, because it served as the money of almost all the nations of eastern Asia and even of the British possessions in North America, the Spanish West Indies, and other countries; and it was also the money of the United States at the time of the declaration of their independence. During the second half of the nineteenth century its use as money has gradually been reduced, and at the present time it circulates only in the Straits Settlements, in the Malay States, the Philippine Islands, and the Chinese Empire, all of them countries of the Far East of Asia. It will soon cease to circulate as legal money in the first three countries,[a] and while it will continue to be used as a trade dollar in the Straits Settlements and in the federated Malay States, it will retain its rôle as money in the Chinese Empire only."

Taxes.—Under date March 27, 1897, the President issued a decree (No. 42) whereby gold and silver are subject to the following taxation:

(1) Interior stamp tax at the rate of 3 per cent on the value of said metals.

(2) Mintage dues at the rate of 2 per cent on the value of said metals.

(3) Assay dues, in conformity with the tariff that the Department of the Treasury may promulgate.

(4) Smelting, refining, and other dues as they may be decreed by the Treasury Department.

A subsequent decree, November 26, 1902, provides that on and after the 1st day of January, 1903, the assessment of the 3 per cent stamp tax and the 2 per cent coinage tax provided for by the law of March 27, 1897, shall be made, in so far as gold is concerned, according to the

[a] Since January 1, 1904, the Mexican dollar has ceased to circulate in the Philippines, being superseded by the "Conant" dollar, worth 50 cents American gold.

commercial value of said metal expressed in silver, which value shall be determined in accordance with the provisions of the following article:

"ART. 2. The commercial value of gold expressed in silver shall be fixed each month, taking as a basis the value of $675.416 that the monetary law assigns to a kilogram of gold, which value shall be reduced to silver dollars according to the average rate of exchange on New York during the first twenty-five days of the previous month."

The Department of Finance, on any of the days between the 25th and 28th of each month, shall notify the directors of the mints and the custom-house collectors said rate of exchange, so that it may be used in the liquidation of the dues on the precious metals presented for coinage or exportation from the first to the last day of the following month. The commercial value of the kilogram of gold, in silver coin, on which to base the estimates during the month of March, 1904, the 3 per cent for the stamp tax and the 2 per cent for the coinage tax in conformity with the decree of November 26, 1902, was fixed at $1,460.32.

The stamp and mintage dues as well as the assay dues will always be paid, whether the pieces are to be coined or whether the metals or substances are to be exported. The smelting dues are to be collected upon such pieces that, not being homogeneous, must be smelted in order to assay them and estimate upon their value. The refining and other dues apply only to pieces to be coined. Foreign coins are exempted from the provisions of section 1, above mentioned, and will only be subject to the payment of coinage dues, as provided in sections 3 and 4, above mentioned, when they are introduced into the mints to be coined.

CURRENCY.

The present monetary system of México is regulated by the law of November 28, 1867,[a] which introduced the decimal monetary system in the country. The preamble of this law states its object to be to establish a uniform system of currency without making any essential modifications in the value of the monetary unit, which shall remain the silver dollar (peso). This dollar is to weigh 27.073281 grams, and be of a fineness of 0.902 plus (0.777 of 0.001). The weight of this dollar is, expressed in grains troy, 417.79. The amount of pure silver in the dollar is 377.139 grains troy. The variation allowed at the mints in the weight is 750 grains either way for each $1,000, and the maximum for each dollar is 1½ grains.

[a] Leyes y disposiciones relativas á la Moneda Nacional—1821-1899—Secretaría de Estado y del Despacho de Hacienda y Crédito Público—México—1900.

The weights of all the silver coins are given below:

Silver coins.[a]	Weight in grams.	Equivalent in grains.
$1	27.073281	417.79
50-centavo	13.536	208.90
25-centavo	6.768	104.45
10-centavo	2.707	41.77
5-centavo	1.352	20.865

[a] By a law passed in December, 1897, the mints commenced, in January, 1898, to coin a new peso and a 20-centavo piece. The peso is of the same weight and fineness, but bears different inscriptions from those on the old *8-real* peso. A bronze centavo was created by decree of December 21, 1899, containing 95 parts of copper, 4 parts of tin, and 1 part of zinc.

The fineness of gold coins is 0.875. The denominations and weights are given in the following table:

Gold coins.	Weight.
	Grams.
$20	33.841
$10	16.920
$5	8.460
$2.50	4.230
$1	1.692

The ratio is 16 to 1.

Specie.[a]—The first monetary census of México, made in 1903, shows the following figures:

Specie.	Gold.	Silver.		Copper.	Total.
		Pesos.	Fractional coin.		
In the banks	$173,512	$48,295,726	$1,677,283.10	$2,428.59	$50,148,949.69
In the trade	250,578	6,707,917	860,839.50	36,758.88	7,856,093.38
In the public treasuries	5,929	2,443,793	354,487.70	18,709.29	2,822,918.99
Private parties	52,866	697,686	79,200.30	3,793.88	833,546.18
Total	482,885	58,145,122	2,971,810.60	61,690.64	61,661,508.24

In his report to the Federal Congress relative to the financial situation of México during the fiscal year 1901–02, the Secretary of the Treasury made the following statements:

The amount of specie held in the various banks of the country during the year in reference, was:

Date.	Banks of the capital.	State banks.	Total.
1901.			
July	$43,345,808.12	$15,383,589.73	$58,729,397.85
August	43,860,996.68	16,033,210.59	59,894,207.27
September	41,494,876.47	16,225,377.56	57,720,254.03
October	39,656,535.44	16,224,866.80	55,881,402.24
November	38,351,931.10	16,456,892.45	54,808,823.55
December	36,902,382.54	16,996,500.49	53,898,882.96
1902.			
January	37,798,926.39	17,184,936.58	54,983,862.99
February	38,326,160.42	17,978,057.59	56,304,218.01
March	38,395,875.43	18,375,728.63	56,771,604.06
April	39,682,396.04	18,625,472.58	58,307,868.62
May	41,062,694.76	18,968,060.85	60,030,755.61
June	43,520,749.33	19,399,385.99	62,920,135.32

[a] See table on page 416, Chapter XIX.

In the preceding fiscal year, 1900–1901, the minimum holding of specie was $46,155,002 in the month of January, 1901; in the fiscal year 1901–2 the minimum was $53,898,000 in December, 1901, as is shown in the foregoing statement; the maximum holding in the former year was $58,220,000 in June, 1901, and in the latter year the maximum was $62,920,000 in June, 1902.

The note circulation advanced from $63,778,000 to $77,467,000; bills discounted rose from $91,865,000 to $108,794,000, and loans on collaterals and mortgages increased in equal proportion. The capital stock of the banks rose from $78,300,000 to $83,300,000, and the unpaid part of this capital was $5,040,000 in June, 1901, and $4,850,000 in June, 1902. The reserve funds were increased by $2,090,000, and the emergency funds by $438,000.

BANKS.

At the end of the calendar year 1902 there were in the Republic 24 banks of issue, 2 mortgage banks, 4 "refaccionarios," or loan banks, and 1 trust company. The paper of the banks of issue is not legal tender, it being covered by large deposits of coin. The Government issues no paper money, and as a rule does not retain any specie in the Treasury vaults, the National Bank, which acts as depository, paying all warrants, etc.

On June 30, 1902, the leading banking institutions of the country held in cash [a] $69,528,374.32, while the amount of bills in circulation was $77,466,988.25, the authorized capital of these institutions, including the Trust Company, being $85,300,000 and the unsubscribed capital $5,850,000. The general condition of these institutions on the date in reference is shown as follows:

Assets.

Unsubscribed capital	$5,850,000.00
Cash	69,528,374.32
Bills receivable	108,794,411.70
Loans on personal property	42,862,303.00
Hypothecary loans	12,057,685.06
Loans on real estate	4,005,664.22
Public funds held by the banks	5,571,865.27
Current debtor accounts	67,513,817.18
Furniture and fixtures	2,546,022.56
Total	318,730,143.31

Liabilities.

Authorized capital	$85,300,000.00
Bills in circulation	77,466,988.25
Mortgage and other bonds in circulation	12,734,300.00
Sight deposits	7,460,105.62
Other deposits	7,421,535.61

[a] By order of the Treasury Department, 1897, banks were forbidden to count as cash on hand notes of their own or other banks, so that the term "cash on hand" represents actual specie.

Current credit accounts	$111,975,877.77
Reserve fund	12,480,293.19
Surplus fund	3,891,042.87
Total	318,730,134.31

New banks.—During the year 1902 six new banks were organized under the charters issued in accordance with the general banking law of March 19, 1897, by the Secretary of the Treasury, with an aggregate capital of $3,300,000, namely:

Banco de Chiapas	$500,000
Banco de Aguascalientes	600,000
Banco de Tamaulipas	1,000,000
Banco de Refaccionario de Chihuahua	200,000
Banco de Oaxaca	500,000
Banco de Hidalgo	500,000

These additions raised the number of chartered banks to 30 at the end of the year 1902.

Five banks during 1902 increased the capital with which they were organized under the original charters, the increase being made with the approval of the Treasury Department and forming an aggregate of $4,750,000, as follows:

Banco Yucateco	$1,500,000
Banco de Jalisco	1,500,000
Banco Mercantil de Yucatán	1,000,000
Banco de Nuevo Leon	500,000
Banco de Guanajuato	250,000

Banks of issue.—The following table shows the banks of issue of the Republic on December 31, 1902, their capital, unsubscribed capital, cash on hand, and bills in circulation, as given in the "Anuario Estadístico," for 1903:

Banks.	Authorized capital.	Unsubscribed capital.	Cash on hand.	Bills in circulation.
Banco Nacional de México	$20,000,000	.....	$18,921,752.62	$28,348,819
Banco de Londres y México	10,000,000	.....	10,689,767.08	18,814,940
Banco Minero de Chihuahua	5,000,000	$500,000	2,474,716.79	3,259,786
Banco Yucateco	6,000,000	.....	4,770,383.06	7,994,869
Banco Mercantil de Yucatán	4,000,000	1,500,000	2,139,827.30	2,311,582
Banco de Durango	1,000,000	.....	486,145.04	790,300
Banco de Zacatecas	1,000,000	400,000	580,864.24	910,061
Banco de Nuevo León	2,000,000	.....	889,237.10	2,243,915
Banco del Estado de México	1,000,000	.....	1,082,443.79	1,858,175
Banco de Coahuila	1,000,000	.....	804,092.58	1,580,185
Banco de San Luis Potosí	1,100,000	227,550	1,329,907.60	2,397,745
Banco de Sonora	1,000,000	250,000	1,305,901.83	2,157,225
Banco Occidental de México	1,000,000	.....	668,957.44	1,142,525
Banco Mercantil de Veracruz	2,000,000	.....	1,721,323.94	2,801,565
Banco de Jalisco	1,500,000	.....	1,217,968.71	1,981,820
Banco Mercantil de Monterrey	2,000,000	500,000	681,518.76	1,156,955
Banco Oriental de México	3,000,000	.....	2,115,075.62	3,191,020
Banco de Guanajuato	750,000	.....	858,770.85	1,474,915
Banco de Tabasco	1,000,000	300,000	416,806.54	679,870
Banco de Chiapas	500,000	245,000	152,703.07	270,620
Banco de Hidalgo	500,000	156,770	198,107.44	208,415
Banco de Tamaulipas	1,000,000	500,000	531,240.91	365,520
Banco de Aguascalientes	600,000	300,000	304,534.11	204,400
Banco de Oaxaca	500,000	250,000	320,983.40	.....
Total	74,550,000	5,129,320	54,663,029.82	86,145,227

Mortgage banks.—The mortgage banks of México on the same date were the "Banco Internacional el Hipotecario de México," with an authorized capital of $5,000,000 and unsubscribed capital of $1,500,000, having bonds in circulation to the amount of $9,851,200, and the "Banco Agrícola Hipotecario de México," with an authorized capital of $2,000,000.

Loan banks.—The loan banks (*Bancos Refaccionarios*) were the fol lowing: "Banco Central Mexicano," capital $7,000,000; "Banco Refaccionario de Campeche," capital, $300,000; "Banco Refaccionario de Michoacán," capital $300,000; and "Banco Comercial Refaccionario de Chihuahua," with an authorized capital of $200,000.

Trust companies.—"Almacenes Generales de Depósito de México y Veracruz;" capital, $2,000,000.

Banking operations.—The status of banking and currency operations within the Republic on December 31, 1902, as compared with the corresponding date of the previous year, was as follows:

The aggregate capital of the banks on December 31, 1901, was $80,300,000, and on December 31, 1902, $89,350,000, an increase of $9,050,000 for the year. The aggregate cash holdings on Demember 31, 1901, were, in specie, $53,898,882; in paper, $5,616,634; total, $59,515,246; December 31, 1902, in specie, $53,008,722; in paper, $4,512,278; total, $57,521,000. The specie in 1902 was $890,160 less than in 1901, and the bank notes in 1902 were $1,104,086 less than in 1901. The aggregate of bank notes in circulation December 31, 1901, was $71,257,626; December 31, 1902, $86,145,225, an increase of $14,887,599.

The aggregate of loans on collaterals December 31, 1901, was $38,782,327; December 31, 1902, $49,908,018, an increase of $11,125,-691. The aggregate of the loans on mortgages December 31, 1901, was $15,186,985; December 31, 1902, $11,735,107, an increase of $2,548,122. The aggregate reserves December 31, 1901, was $14,239,-293; December 31, 1902, $16,772,855, an increase of $2,533,562. The debtor accounts in December, 1901, were $63,365,009; in December, 1902, they were $82,598,859, an increase of $19,233,850. The creditor accounts in December, 1901, were $98,422,621; in December, 1902, they were $133,274,090, an increase of $34,854,469.

Principal banks.—The three principal banks of the Republic are: The National Bank of México, a stock company, with branch offices at Chihuahua, Durango, Guadalajara (Jalisco), Guanajuato, Mazatlán (Sinaloa), Mérida (Yucatán), Monterey (Nuevo Leon), Oaxaca, Puebla, San Luis Potosí, San Juan Bautista (Tabasco), Tampico (Tamaulipas), Veracruz, and Zacatecas; the International and Mortgage Bank, a limited stock company, having a board of directors in the City of México and another in New York, and the London and México Bank, also a stock company, with branch offices in Guadalajara, Guanajuato,

Lerdo, Mazatlán, Monterey, Morelia, Puebla, Querétaro, San Luis Potosí, and Veracruz.

The Bank of London and México commenced its operations in the Republic under the name of the Bank of London, México, and South America, without a Federal concession. This was not necessary according to the law then in force. When, in 1884, owing to the commercial code, it became necessary to obtain such a concession, that of the Employees' Bank was transferred to it with modifications. In 1889 a new contract was executed, changing the name to the Bank of London and México, and further modifying the contract of 1886.

The Mexican National Bank was established in 1881, the contract being modified in 1884, when permission was granted to combine with the Mercantile Mexican Bank and change the name of the institution to National Bank of México.

The Mortgage Bank (Banco Hipotecario) was established by virtue of a concession bearing date of May 22, 1882, and modified in August, 1888, when its name was changed to that it now bears (International and Mortgage Bank of México) and its capital increased.

The oldest banking institution of México is the Monte de Piedad (National Pawn Shop), which was established in 1775, with a capital of $300,000, given by Don Pedro Romero de Terreros. Formerly it possessed the authority to issue notes, but this authority has been revoked and all the notes redeemed. It is in reality a charity, the business of which amounts to over $1,000,000, distributed among 60,000 borrowers.

The existing banks are prosperous and in a flourishing condition, but the demand for increased facilities are such that new banks are being established and the operations of the old ones increased and extended in various directions.

The privileges of issuing bank notes or bills on demand in the Federal District is confined to the Bank of London and México and the National Bank. Though this privilege is also granted to the banks to be established in the States of the Republic, they will not be permitted officially to establish redemption agencies for their notes in the capital, and it will be a long time before the bills of the States' banks occupy the same position in the public confidence as those issued at the capital, though they are now circulating more freely. There are a great many private banking houses in the City of México and elsewhere, which have a high standing and do an excellent business.

American capital.—Consul-General Barlow, in his report before quoted, states the following in regard to American investments in banking in México:

"American capital is beginning to assume importance in the banking of México, and this interest is one that is growing rapidly. American methods, which were unknown here a few years ago, have revolutionized banking in this country and placed it on a business rather

than a social basis. As yet the total amount of American capital invested in banking in this country—naturally mainly in this city—is relatively small, but it is a powerful leaven in the loaf, and threatens to become the body of it in the next few years. American capital has recently acquired considerable interests in three of the leading banks of México, namely, the London Bank, the Central Bank, and the International and Mortgage Bank. Two trust companies, in which American capital is mainly interested, have recently started in this city. The two small American banks which are operating here have been thus far very successful, and others are now being started in various cities of the Republic where there are large American interests."

Banking methods—Bank failures are unknown in México. The Government has an inspector attached to each bank, whose duty it is to exercise a strict supervision over the issuance of bank notes, and other operations of the notes being dependent upon his signature.

LEGISLATION.

The law providing for the establishment of banks, passed on June 3, 1896, also provides that the Executive of the Union is authorized to issue a General Law by which the concession, establishment, and operations of banks of issue in the States of the Republic are to be governed, subject to the following provisions:

1. No concession shall be granted without the deposit by the concessionaries of bonds of the national public debt, whose nominal par value shall be at least equal to 20 per cent of the sum which the bank is to have in cash in order to begin operations.

2. The minimum capital subscribed shall be $500,000, of which at least half shall be paid in cash before the bank begins operations.

3. The cash balance in each bank shall never be reduced to less than half the amount of its circulation notes and the amount of deposits payable on demand, or at three days' sight or less.

4. No bank shall be authorized to issue circulation notes for a sum greater than three times the amount of its paid-up capital.

5. The bank notes may be accepted as currency and shall not be of a lower denomination than $5.

6. Exemptions or rebates from taxes shall only be allowed to the bank first established in any of the States or Federal Territories of the Republic. All other banks shall pay the taxes imposed by the general laws, and, furthermore, a special tax to the Federation of 2 per cent per annum upon the amount of their paid-up capital. For the purposes of this section, first banks shall be considered such as are now established, provided they subject themselves to the provisions of the general law.

7. Banks established in a State shall not have beyond the same branch offices for the conversion of their notes, save by special permission from the Executive, who will grant the same only when close business interests bind several States, but never for the establishment of said branch offices in the City of México or in the Federal District.

8. The Federal Executive shall have at the banks an interventor, whose duties shall be specified and who, at the revision of the annual balances, shall have the same authority granted by law to the commissaries of corporations.

9. Banks shall publish a monthly balance sheet, which shall show, besides the balances of accounts required by law, the cash on hand, amount of bank notes in circulation, and amount of deposits payable on demand or at three days' sight or less.

10. No concessions shall be granted by the Executive of the Union until after the promulgation of the general banking law and in conformity with its provisions.

The Executive is likewise authorized:

1. To enter into agreements with the National Bank of México, pursuant to which, and through such compensation as may be deemed equitable, all variances between the concession of said bank and the promulgation of the general law referred to in the foregoing article shall be removed.

2. To enter into agreements with banks already existing pursuant to special concessions, provided that State banks, in order to enjoy the benefits of the general law, shall relinquish the concessions under which they were established.

3. The authority granted the Executive by the present article to enter into agreements with the State banks shall cease six months after the publication of the general law, and that granted for other purposes shall terminate on the 15th of next September.

The regulations which are to govern all other institutions of credit may be the subject of the said law or of other special laws that the Executive may issue as he may deem best.

4. The Executive will report to Congress, with respect to his action under the authority conferred upon him by this law, at the session next following the publication of the decree or decrees in the premises.

Pursuant to the authority in him vested by this law, the President on March 19, 1897, promulgated the "General Law relating to institutions of credit." The main features of this law are as follows:

For the purposes of the law the following only are considered as institutions of credit: Banks of issue, mortgage banks, and loan (*refaccionarios*) banks.

Banks of issue are such as issue notes of a given value, payable at par, at sight, and to bearer.

Mortgage banks are such as make loans secured by mortgage on urban or suburban real estate, and issue bonds secured in like manner, bearing interest and payable under given circumstances at fixed dates.

Loan banks (Bancos Refaccionarios) are such establishments as are intended to facilitate mining, agricultural, and industrial operations by means of privileged advances, unsecured, assuming liability for determinate operations, and issuing bonds promptly maturing, bearing interest, and payable on a day certain.

Credit institutions can only be established under a special concession granted by the Executive in conformity with the requirements and conditions of this law and the act of June 3, 1896.

Concessions for the establishment of institutions of credit may be granted to private individuals or corporations, but business operations under such concessions can only be conducted by corporations duly constituted in the Republic.

Concessions to private parties shall be granted to three persons at least, who must prove, within the succeeding three months, the incorporation of the association which is to operate under the concession and the assignment of the latter thereto.

Corporations of this kind are governed by the commercial code whereinsoever it does not conflict with the following provisions:

1. The number of corporators shall be seven, at least.

2. The corporate capital shall never be less than 500,000 pesos in the case of banks of issue and mortgage banks, nor less than 200,000 in the case of loan banks.

3. Express authority of the Department of the Treasury is necessary to increase or reduce the corporate capital.

4. No incorporation may be effected unless the corporate capital is fully subscribed and the 50 per cent thereof payable in cash paid in.

5. The domicile of the corporation shall be the place in the Republic where the principal office is located.

6. Certificates of shares may be in the names of individuals until their value shall be fully paid in.

7. The reserve fund shall consist of 10 per cent of the net annual profits until it shall equal a third part or more of the aggregate corporate capital.

In no case shall the duration of the concessions exceed thirty years, reckoned from the date of this law, for banks of issue, and fifty years for mortgage and loan banks. Foreign banking institutions issuing notes payable to bearer can not maintain branches or agencies in the Republic for the issue and payment of the same.

The articles of incorporation and by-laws of all corporations referred to in this law shall be submitted for approval to the Department of the Treasury before the bank opens for business.

Banks of issue may be established and operate in the States and Territories subject only to the provisions of this law. Such banks in the Federal District will continue to be governed by existing contracts and provisions.

Bank notes of the denominations of 5, 10, 20, 50, 100, 500, and 1,000 pesos only shall be placed in circulation.

The notes must express in Spanish the obligation to pay in cash at par, at sight, and to bearer the face value thereof. The date of issue, series, and number of the note, as well as the signatures of the Government interventor, one of the directors, and of the manager or cashier of the same, must also appear.

Bank notes bear no interest and are imprescriptible during the life of the institution. The obligation to pay shall lapse by limitation five years after the bank is declared in bankruptcy or it shall go into liquidation.

Banks of issue are prohibited from—

1. Making loans or discounting or negotiating securities when the date of maturity exceeds six months.

2. Discounting promissory notes or other commercial paper without two responsible indorsements at least, or without collateral security.

3. Making loans secured by mortgage, save in the cases mentioned below.

4. Pledging or depositing their notes and contracting any obligations thereby.

5. Mortgaging their property or pledging their discounted paper.

Banks of issue may only accept security by way of mortgage when the credit of any of the responsible indorsers of discounted paper shall have suffered loss, and when the Department of the Treasury shall expressly authorize the same.

No individual or corporation not authorized thereunto by the provisions of this law may issue any promissory note or paper containing a promise to pay in cash, to bearer, at sight.

Mortgage banks may make loans secured by mortgage as follows:

1. Short-time loans bearing simple interest, payable on a day certain.

2. Long-time loans, reimbursable in annual payments to include interest, reduction on principal, and remuneration to the bank.

Short-time loans are such as are payable in one or more installments, but always in less than ten years.

With respect to loans reimbursable in annual payments, the number of such payments shall not be less than ten nor more than forty, should, the same be made in quarterly, semiannual, or annual installments.

The bank's mortgage should always have priority, either because the real estate has no other mortgage attaching to it, or because, if previously mortgaged, preference be given the new loan through subro-

gation or pursuant to the express consent of the preferred creditors, or through any other means authorized by law.

Mortgage loans shall never exceed one-half the value of the property mortgaged, to be appraised by experts named by the bank, unless an appraisement for taxation, made in due form of law exists, in which case the Department of the Treasury may authorize banks to act upon such appraised valuation.

Only such urban or suburban real estate as is situated within the States, Federal District, or Territories where the principal office or branch offices of the bank are located shall be the subject of mortgages.

Property held under certain titles may not be mortgaged to secure loans.

Banks can not make secured loans on mines, forests, temples, nor real estate specially devoted to some public service of the Federation, States, or municipalities.

The aggregate amount of sums loaned and secured by mortgage shall at no time exceed twenty times the paid-up capital of the loaning bank, nor shall the sums loaned any individual or association exceed the one-fifth part of such capital.

Moneys due by debtors in payment of installments on the principal, or for interest, can not be withheld or in any way restrained by law or otherwise.

The nominal value of the mortgage bonds these banks are authorized to issue shall never exceed the aggregate amount of secured loans.

These bonds shall bear such interest as the board of directors of the banks may determine.

The bonds shall be of the denominations of 100, 500, and 1,000 pesos, respectively, and assignable by simple transfer if payable to bearer, or by indorsement if payable to order.

Mortgage bonds may be issued either without date of maturity or payable on a day certain. The former shall be taken up through drawings.

There shall be two drawings at least in every year, and at each drawing there shall be taken up the number of bonds that may be necessary in order that the nominal value of those still in circulation shall in no case exceed the aggregate amount of the secured loans of the bank.

Within eight days after the drawings the numbers of the bonds drawn shall be published, as also the date upon which they should be presented for payment. These bonds shall cease to bear interest from the date designated for their payment.

The banks may provide for extra drawings should they see fit. Bonds so paid shall be canceled and destroyed.

Mortgage banks shall keep on hand at all times a special guaranty fund in cash, which shall always be greater than the semiannual interest on the bonds in circulation.

Besides making loans secured by mortgage and issuing bonds, mortgage banks are authorized to engage in the operations following:

1. To invest in their own bonds and in other first-class securities.

2. To make loans for not more than six months, secured by such securities as collateral.

3. To receive deposits, paying, or not, interest thereon.

4. To draw, buy, sell, and discount bills of exchange, drafts, orders, or checks, payable in the Republic or abroad at a date not to exceed six months.

5. To sell, buy, or collect on commission, directly or through agents, all kinds of securities.

6. To loan, with proper security, the mortgage bonds deposited as security.

7. To make loans or advances for public works or improvements, entering into the necessary contracts for the purpose with the Federal, State, and municipal governments.

Mining stock certificates are expressly excluded from the securities in which the banks are allowed to invest.

Banks may receive deposits only to an amount not greater than five times the paid-up capital; and they are bound to keep on hand at all times in cash, gold or silver bullion, or immediately convertible securities, an amount equal to two-thirds, or more, of the aggregate deposits.

Loans made to the Federal, State, and municipal governments must be secured by mortgage on real estate, lien on taxes specially levied, or by the securities issued to raise the funds necessary to execute the public works referred to.

Mortgage banks are prohibited from issuing bank notes, or any other security payable on demand to bearer.

The concluding sections treat of the legal steps to be taken to foreclose mortgages, and exempt banks of this kind from furnishing the bonds required in legal proceedings.

Loan banks are authorized to engage in the operations following:

1. To make cash loans, payable within two years, to mining, industrial, and agricultural enterprises.

2. To pledge their responsibility in order to facilitate the discounting or negotiating of promissory notes or obligations maturing not later than six months after date.

3. To issue bonds payable in coin, bearing interest and maturing in not less than three months nor more than two years after date.

The law gives banks of this kind a first lien on all mines, products, crops, live stock, machinery, tools, agricultural implements, etc., which may be pledged to the payment of a loan.

The value of the coin bonds issued by loan banks shall never exceed

the amount on hand in cash or in bars of the precious metal, plus the value of immediately convertible securities held as bills collectible.

These banks are prohibited:

1. From issuing bank notes.

2. From engaging in mortgage operations and from issuing mortgage bonds.

3. From working on their own account mines, reduction works, industrial establishments, or agricultural estates, and from entering into any open association, or as silent partners, with parties representing such enterprises.

Banking institutions are prohibited from acquiring real estate under any title whatsoever, other than that necessary for the establishment of their offices and dependencies, and such as may be adjudicated to or received by them in the collection of their debts or in the exercise of the rights incident to the operations in which they engage. The real estate adjudicated and received as above must be conveyed away within three years, in the case of mortgage banks, and within two years in the case of loan and issue banks. At the expiration of such terms without any conveyance, the Department of the Treasury shall order a public sale of the real estate.

Banking institutions shall not buy their own stock nor engage in any operation requiring it for security.

The consolidation of two or more banks can not be effected without the previous approval of the Department of the Treasury.

Banking institutions must publish a monthly balance sheet showing at least the information following:

Under assets:

1. Uncalled capital.
2. Cash on hand.
3. Notes discounted.
4. Loans on collateral.
5. Loans on mortgage.
6. Investments in public securities and immediately convertible paper.
7. Accounts current, debtor.
8. Real estate belonging to the bank.

Under liabilities:

1. Capital.
2. Circulation.
3. Deposits.
4. Accounts current, creditor.
5. Reserve and emergency funds.

The Department of the Treasury shall publish a yearly statement of the condition of the banking institutions of the Republic.

The last chapter of the law treats of franchises and taxes. It pro-

vides that the capital of banking institutions, the shares representing the same, dividends paid to shareholders, and the several kinds of securities issued by them shall be exempt from every manner of taxation, Federal, State, and municipal, save the real estate tax on the buildings occupied by them for office purposes and the stamp tax. There are, however, numerous exemptions from this latter burden.

Since the publication of the foregoing law the Treasury Department has entered into a contract with each of the State banks formerly established, in which the banks waive the rights acquired under their original concessions and subject themselves to the requirements of the new law, thereby enjoying the privileges accorded to the first bank instituted in each State. Each of the banks has five years within which to call in its notes of a denomination less than 5 pesos.

Use of the word "bank."—On May 28, 1903, a Presidential decree was promulgated bearing on this subject, as follows:

"ARTICLE 1. Only corporations legally constituted for the operation of institutions of credit, by virtue of concessions granted by the Government, can use the name of 'bank' or its equivalent in any foreign tongue as part of their corporate titles or establishments.

"ART. 2. The charter of any company, of which the word 'bank' or its translation into any foreign tongue forms part, can not be recorded in the commércial registry unless the articles of incorporation contain official documents proving the existence of a concession granted to said company by the Department of Finance and Public Credit, in accordance with the provisions of the general law on institutions of credit.

"ART. 3. Notwithstanding the provisions of article 1 of this act, native or foreign corporations at present existing in the Republic and embodying in their corporate name the word 'bank,' or its translation into any foreign tongue, may continue to use the same name as hitherto, by adding the words 'without concession' every time they use their commercial title.

"ART. 4. Foreign corporations having, or that may establish agencies or branch houses in the Republic in accordance with Méxican laws, shall be entitled to make use of the word 'bank.'

"In order to enjoy this right, such foreign companies must previously obtain a special permission from the Department of Finance and Public Credit. This permission will only be granted under such conditions as the Department may deem expedient, and when in its opinion it is proved that the parent house does a banking business in the country where it was founded, and no valid reasons exist for fearing that an improper use will be made of the franchise.

"ART. 5. Within a year from the date of the present law, native or foreign corporations in the Republic using in their corporate name the word 'bank,' or its translation into any foreign tongue, must

either change said name by the suppression of such word, or make use of the right granted by articles 3 and 4 of this law.

"ART. 6. Any action growing out of the violation of the provisions of this law, either by the improper use of the word 'bank,' or by failure to add the words 'without concession,' when they are required to be used, shall be brought ex officio by the prosecutor before the Federal courts, and shall be punished by a fine of the second class. If the offender is a company, its managers or administrators shall pay the penalty."

CHAPTER XIV.

MEANS OF COMMUNICATION—RAILROADS AND RAILROAD LAW—TELEGRAPH AND TELEPHONE LINES—POSTAL SERVICE—STEAMSHIP LINES.

Notwithstanding earnest endeavors to foster railroad construction in México, for many years the topographical conditions of the country rendered such enterprises both difficult and expensive. Means of communication were limited to a few wagon roads, over which twenty-four regular lines of diligences were operated under one management, supplemented by a few bridle paths, leading from the Central Plateau over the Sierras to points on the Pacific and Gulf coasts.

RAILWAYS.

In 1854 the first section (about 4 kilometers in length) of what afterwards became the Mexican Railway was finished, connecting the City of México with Guadalupe, and, with another line about 19 kilometers long, between Veracruz and Tejería, constituted the railways of the Republic until 1861. The French army, during the war of intervention in 1862, carried the Tejería section as far as Paso del Macho, at the foot of the mountains, a distance of about 56 kilometers. About the same time an English syndicate, which had a concession from the Government to build a road from the capital to Veracruz, extended the Guadalupe road to Puebla, the entire line to Veracruz being completed in 1873. It is from this period that the era of railroad development in México dates, new impetus being given to this branch of public service by the installation of General Díaz as President, in 1876. From 1877 to 1882 México built more miles of railroad than any other Latin-American country, the average yearly construction during that period being 689 kilometers.[a]

In his message to Congress, April 1, 1897, President Díaz, in referring to the extent of railway development in the Republic, stated that in 1875 there were 578 kilometers 285 meters of road; in 1886, 5,915; in November, 1888, 7,940; in June, 1892, 10,233, or, including the tramways and other local private lines, 11,067 kilometers; in Septem-

[a] Informe del C. General Porfirio Díaz, Presidente de los Estados Unidos Mexicanos, á sus compatriotas, 1896.

ber, 1894, 11,100, and in April, 1897, the total extent amounted to 11,469 kilometers. The same document also gives the following figures in regard to traffic:

	1876.	1890.	1898.	1895.
Number of passengers	4,281,327	19,531,395	22,781,343	24,269,695
Freight handled (tons)	132,915	2,734,430	3,798,360	4,796,260
Gross receipts	$2,564,870	$21,019,960	$26,121,624	$28,756,450

It is also stated that the subsidies paid for railroads up to December, 1892, averaged $8,935 per kilometer built and in operation at that date, and up to June 30, 1896, the total amount paid in subsidies reached $107,743,660.25, distributed as follows:

Paid in cash	$46,896,901.95
Certificates of construction (convertible into 5 per cent bonds)	21,711,513.92
Paid in bonds	31,127,000.00
Balance, payable either in cash or bonds	8,008,244.38

Taking into consideration that in the $31,127,000 paid in bonds, $13,500,000 are included, which were paid in gold to the contractors of the Tehuantepec Railway at 100 per cent premium, such sum must be regarded as $27,000,000 silver, thus increasing the former total to $121,343,660.35 silver.[a]

In his message to Congress, September 16, 1903, the same authority makes the following statement:

"The increase of the railway system from the 1st of January, 1903, to the date of the message has been 432 kilometers, of which 180 kilometers have to be credited to the National Railway of México on its new line between Huehuetoca and Gonzalez Junction; 70 to the Kansas City, México and Orient line; 78 to the Central, on its Panuco and San Pedro to Paredón divisions; 14 to the Interoceanic, which has completed its line from Cuautla to Chietla, and the remainder to the other lines. The railways of the Republic now aggregate 15,918 kilometers, and if railways subject to the jurisdiction of the States and private branches be added, the total is 18,197 kilometers. I may add that the National Railway of México only lacks 92 kilometers to complete the standardizing of its gauge between the capital city and Laredo."

Most of the railways built in México have obtained large subsidies from the Government, ranging from $6,000 to $10,000 per kilometer, according to the difficulties of the work, these subsidies having contributed very largely to the prosperous condition of the roads, as the proceeds have been used not only to build the line, but in some cases to pay the interest on bonds.

At present the railroad system of the Republic connects the capital with the principal centers of population, commerce, and production;

[a] "Los Estados Unidos Méxicanos, sus progresos en veinte años de paz, 1877–1897." Rafael de Zayas Enriquez, New York, p. 195.

also with some of the more important seaports of the Republic and with the United States. The Tehuantepec road, formerly owned and operated by the Government, is the only line connecting the Pacific and Gulf coasts. Lines traversing the central plateau as far as the United States frontier connect the City of México with the capitals of Querétaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Chihuahua, and San Luis Potosí, over the Central Railroad, while the International road connects it with Durango; the National line with México (Toluca), Guanajuato, Michoacán, San Luis Potosí, Coahuila, and Nuevo Leon; the Mexican International with Puebla and Veracruz (via Orizaba and Jalapa), and the Southern Mexican with Puebla, Tlaxcala, and Oaxaca. The port of Manzanillo is connected with the capital of Colima; the port of Matamoros with Reynosa and San Miguel, in Tamaulipas; Tampico with San Luis Potosí and Monterey, and the Tehuantepec line connects Coatzacoalcos on the Gulf with Salina Cruz on the Pacific. The International in its southern extension passes near Cuernavaca (Morelos), and the Cuernavaca and Pacific road runs to Igualá (Guerrero) and will soon connect with Acapulco on the Pacific. Mérida on the Yucatán Peninsula is connected by rail with Progreso and Campeche.

The slopes on the Pacific side of the great central table-land present much greater engineering difficulties than those on the east or Gulf side, hence the slow development of means of communication in the former section.

According to the latest available statistics from México, the number of kilometers of railroad on Decmber 31, 1902, was as follows:

	Meters.
Railroads under Federal grants	15,137,505
Tramways	502,332
Suburban lines under State grants	1,498,054
Portable railways, Decauville system	2,299,329
Total	19,437,220

The following table shows the name of the railroads, date of concession, and the total earnings for all the roads operating under Federal grants on December 31, 1902, the latest available Mexican official data:[a]

Name of railroad.	Date of concession.	Total earnings, 1902.
Ferrocarril Mexicano	Nov. 27, 1867	$5,100,828.10
Ferrocarril del Distrito Federal	Dec. 25, 1877	2,261,479.74
Ferrocarril Nacional de México	Sept. 13, 1880	8,818,778.23
Ferrocarril de Sonora	Sept. 14, 1880	1,216,124.27
Ferrocarril Interoceánico	Apr. 16, 1878	4,625,248.32
Ferrocarril Central Mexicano	Sept. 8, 1880	21,132,226.98
Ferrocarril de Cuernavaca y Pacífico[b]	Dec. 31, 1895	.....
Ferrocarril de Tehuacan á Esperanza	Nov. 28, 1883	85,676.58
Ferrocarril Occidental de México (Sinaloa and Durango)	Aug. 16, 1880	69,583.96
Ferrocarril de Tlalmanalco á Chalco[c]	Feb. 3, 1881	.....
Ferrocarril Internacional Mexicano	June 7, 1881	6,497,491.08

[a] Anuario Estadistico, 1902.
[b] Data included in figures representing earnings of the Central Mexicano.
[c] Now called "Xico á San Rafael." (See table.)

Name of railroad.	Date of concession.	Total earnings, 1902.
Ferrocarril de Santa Ana á Tlaxcala	Dec. 11, 1882	$12,993.60
Ferrocarril de Toluca á S. Juan de las Huertas	May 25, 1883	34,890.87
Ferrocarril de Vanegas, Cedral, Matehuala y Rio Verde[a]	June 11, 1883	.....
Ferrocarril Mineral de Chihuahua	Dec. 2, 1898	63,176.61
Ferrocarril Mexicano del Sur	Apr. 21, 1886	882,054.59
Ferrocarril de Monterey al Golfo[a]	Nov. 10, 1887	.....
Ferrocarril de Cordoba á Tuxtepec[b]	May 19, 1888	.....
Ferrocarril de Michoacán al Pacífico[a]	Aug. 16, 1888	.....
Ferrocarril de Monte Alto	Aug. 30, 1888	53,614.39
Ferrocarril Industrial de Puebla	Aug. 8, 1888	61,671.88
Ferrocarril Mexicano del Norte	Apr. 15, 1890	432,993.11
Ferrocarril de Campeche á Lerma	Feb. 23, 1887	4,504.07
Compañía Constructora Nacional Mexicana	Sept. 13, 1880	144,474.92
Ferrocarril de Toluca á Tenango	Dec. 31, 1891	104,316.94
Ferrocarril de Rio Grande, Sierra Madre y Pacífico	Mar. 24, 1896	286,825.13
Ferrocarril de Lerdo á Torreon	July 4, 1898	168,947.21
Ferrocarril de Torres á Minas Prietas	June 10, 1897	65,845.69
Ferrocarril de Esperanza á Xúchil	Dec. 9, 1892	255,729.53
Ferrocarril de Xico á San Rafael	Mar. 23, 1898	165,134.54
Ferrocarril de Jalapa á Teocelo	Dec. 6, 1895	89,350.63
Ferrocarril de Veracruz al Pacífico	Mar. 15, 1898	241,568.91
Ferrocarril de Cazadero á Solis	Dec. 13, 1893	7,045.00
Ferrocarril de Coahuila y Pacífico	Jan. 17, 1899	257,948.49
Ferrocarril de Tenango á Santa María	Aug. 28, 1900	3,471.00
Ferrocarril de Chihuahua al Pacífico	May 11, 1891	344,764.25
Ferrocarril de Tlacotepec á Huajuapan de Leon	Apr. 20, 1891	29,869.47
Ferrocarril de San Juan Bautista á Tierra Colorada ó Rio Gonzales	Dec. 17, 1895	12,304.32
Ferrocarril de Guanajuato á Dolores Hidalgo[a]	June 5, 1893	.....
Ferrocarril de Parral y Durango	June 29, 1898	279,488.98
Ferrocarril Oriental Mexicano	Jan. 11, 1902	112,248.85
Ferrocarril de Nacozari	Aug. 30, 1899	122,741.44
Ferrocarril de Oaxaca á Ejutla	Apr. 15, 1898	43,745.72
Ferrocarril de Naco á Cananea	Oct. 8, 1900	452,949.73
Farrocarril de Marfil á San Gregorio	Dec. 30, 1898	41,268.01
Farrocarril de Orizaba al Ingenio	Sept. 22, 1881	.....
Ferrocarril de Mérida á Peto	Mar. 27, 1878	.....
Ferrocarril de Veracruz á Alvarado	Mar. 26, 1878	212,745.90
Ferrocarril de Mérida á Progreso	Jan. 17, 1874	.....
Ferrocarril de Coahuila á Zacatecas	June 2, 1873	.....
Ferrocarril de Jalapa á Coatepec y Las Fuentes	June 3, 1893	.....
Ferrocarril de Tultenango á la Trinidad	June 19, 1897	111,658.88
Ferrocarril de Hidalgo	Feb. 2, 1878	.....
Ferrocarril de Mérida á Campeche	Feb. 23, 1887	.....
Ferrocarril de Mérida á Valladolid	Dec. 15, 1890	.....
Ferrocarril de San Andres Chalchicomula	Sept. 20, 1881	15,235.27
Ferrocarril de San Marcos á Tecolutla[c]	June 25, 1881	.....
Ferrocarril de San Juan Bautista á Paso del Carrizal	Sept. 17, 1881	25,980.40
Ferrocarril de Cárdenas á Rio Grijalva	May 12, 1883	.....
Ferrocarril de Mérida á Izamal	May 15, 1884	.....
Ferrocarril de Salamanca y Jaral	Aug. 30, 1888	.....

[a] Data included in figures representing earnings of the Ferrocarril Nacional.
[b] Now called "Veracruz al Pacífico." (See table.)
[c] Data included in the figures for the "Interoceanico."

Besides the railroads already mentioned as belonging to the Mexican Central, the following lines should be added: Pachuca á Tampico, Ferrocarril de Cuernavaca y Pacífico, Tula á Pachuca, Lerdo á San Pedro de las Colonias, Ferrocarriles Industriales, and San Bartolo y Rio Verde.

Other railroads in the Republic, operating under State grants, are shown in this table:

State.	Total length of line.	Length of city lines.	Length of suburban lines.	Length of portable railways.	Power.		
					Horse.	Steam.	Electricity.
	Meters.	*Meters.*	*Meters.*	*Meters.*	*Meters.*	*Meters.*	*Meters.*
Aguascalientes	17,224	12,054	5,170	.....	12,054	5,170	.....
Campeche	228,540	27,000	107,540	94,000	225,000	3,540	.....
Coahuila	32,926	17,936	13,340	1,650	27,926	5,000	.....
Colima	7,000	3,000	4,000	.....	7,000	.....	.....
Chiapas	4,000	.....	4,000	.....	.....	4,000	.....
Chihuahua	57,363	10,363	47,000	.....	9,000	47,000	1,363

BRIDGE ON THE BALSAS RIVER (MEXICAN CENTRAL AND PACIFIC RAILWAY), STATE OF GUERRERO.

State.	Total length of line.	Length of city lines.	Length of suburban lines.	Length of portable railways.	Power.		
					Horse.	Steam.	Electricity.
	Meters.	*Meters.*	*Meters.*	*Meters.*	*Meters.*	*Meters.*	*Meters.*
Durango	57,400	7,000	50,400		7,000	50,400	
Guanajuato	156,809	38,248	89,404	29,157	156,809		
Guerrero	6,252			6,252	6,252		
Hidalgo	21,612	21,612			21,612		
Jalisco	113,111	66,189	46,922		90,056	23,055	
México	9,050	9,050			9,050		
Michoacán	32,506	10,151	22,355		32,506		
Morelos	51,972	2,602	8,870	40,500	51,972		
Nuevo León	85,937	30,937	55,000		41,937	44,000	
Oaxaca	1,500	1,500			1,500		
Puebla	369,559	51,350	266,509	51,700	360,809	8,750	
Querétaro	38,240	11,240	27,000		38,240		
San Luis Potosí	70,150	33,650	32,500	4,000	54,650	15,500	
Sinaloa	6,175	4,042	2,133		6,175		
Sonora	28,338	7,338	21,000		7,338	21,000	
Tabasco	64,311	18,211	3,000	43,100	64,311		
Tamaulipas	19,971	16,623	3,348		19,971		
Territory of Lower California	47,142		47,142			47,142	
Territory of Tepic	1,000	1,000			1,000		
Tlaxcala	38,421		38,421		38,421		
Veracruz	118,884	46,574	43,310	29,000	97,034	21,850	
Yucatán	2,546,372	35,712	510,690	1,999,970	2,484,372	62,000	
Zacatecas	67,950	18,950	49,000		25,950	42,000	
Total	4,299,715	502,332	1,498,054	2,299,329	3,897,945	400,407	1,363

On the 31st of December, 1903, the number of kilometers of railways in operation in México was 16,474, divided into five groups as follows:

	Kilometers.
Steam traction	15,953.956
Electric traction	12.749
Animal traction	240.271
Electric, steam, and animal traction	241.428
Animal and steam traction	25.500

The first group consists of the various lines which constitute the general steam railway system of México.

The second group consists of the 10.817 kilometers from Lerdo to Torreon, and 1.932 kilometers of the Ciudad de Juarez tramways, which use solely electric traction.

The third group embraces the 17 side lines of varying lengths from stations on the main steam lines, which use traction by mules or horses, and may be called local feeders.

The fourth group consists of the tramways in the Federal District which radiate from the Zócalo or Central Square in front of the National Palace to all parts of the city, and to all the suburbs; these use electric traction on all the principal lines, steam on one outside freight line, and animal tractión on various minor lines which have not yet been changed from the primitive construction.

The fifth is the line from Esperanza to Xuchil which uses steam on one part and mules on the other.

Capital invested.—The total amouut of foreign capital invested in Mexican railways in 1903, less the sum paid in subsidies, was $767,151,849 Mexican currency, according to "The Mexican Journal

of Commerce," April 1, 1904. The amount involved in the several roads are as follows:

Mexican	$82,421,653
Mexican Central (entire system)	361,510,194
National (not including controlled line)	169,797,304
International	83,688,440
Interoceanic	54,983,851
Mexican Southern	24,000,000
Chihuahua and Pacific	16,511,145
Mexican National Construction Company	1,760,000
Kansas City, Mexico and Orient	1,522,206
Mexican Northern	3,652,000
Chihuahua Mineral	682,864
Nacozari to the border	1,650,000
Naco to Cananea	2,500,000
Parral and Durango	2,200,000
Sierra Madre	6,846,000
Sonora	15,035,125
Tlacotepec and Huajuapam	1,000,000
Tultenango and Yondese	754,287
Veracruz and Alvarado	1,000,000
Veracruz to Pacific	22,000,000

The amounts above are figured at an exchange of 220.

The number of roads constructed with Mexican capital alone is 55, a total mileage of something in the neighborhood of 4,000 kilometers. These roads are mostly of narrow gauge type and average on the whole about 70 kilometers to the line.

Subsidies.—The total amount paid in subsidies, according to the same authority, was $151,251,096.68, of which the Tehuantepec National received the largest share, with the Mexican Central following the second.

The aggregate amounts paid to each road are as follows:

Tehuantepec National	$45,708,428.53
Mexican	13,685,194.59
Progreso to Merida	218,718.00
Hidalgo	947,296.37
Veracruz to Alvarado	394,000.00
Mérida to Peto	871,295.83
Interoceanic	6,536,377.74
Sinaloa and Durango	557,343.01
Mexican Central	27,301,395.00
Mexican National	12,309,870.00
Sonora	2,171,310.00
Mérida to Valladodil	298,158.00
Tlalmanalco Railroad	159,900.00
Mérida to Campeche	1,124,665.00
San Marcos Nautla	419,508.00
San Juan Bautista	20,125.00
Chalchicomula Railway	22,238.65

Tlaxcala to Santa Ana	$28,000.00
Cardenas to Grijalva River	33,750.00
Toluca to las Huertas	46,250.00
Venegas, Cedral, Matehuala and Rio Verde	341,000.00
Mérida to Sotuta	395,088.00
Mexican Southern	11,248,805.10
Tonalá to frontier	444,000.00
Monterey and Mexican Gulf	5,534,552.24
Tecolutla Espinal	100,500.00
Córdoba to Tuxtepec	408,000.00
Pachuca to Tampico	665,000.00
Michoacán and Pacific	502,000.00
Mexican Northeastern	294,000.00
Salamanca to Valle de Santiago	280,000.00
Veracruz to Boca del Rio	83,000.00
Tula to Zacualtipan and Tampico	560,000.00
Lower California	31,300.00
Monte Alto	182,000.00
México, Cuernavaca and Pacific	5,225,300.00
Oaxaca Coal Railway	603,700.00
Chihuahua and Pacific	1,400,000.00
Jerez to Corralitos	2,000,000.00
Veracruz and Pacific	3,569,500.00
Xico and San Rafael	587,500.00
San Luis Potosí and Rio Verde	240,000.00
San Marcos to Tecolutla	150,850.00
Tacubaya y Santa Fé (D. F.)	16,800.00
Mexican National Construction Company	968,965.00
Sierra Madre	1,890,000.00
Tlacotepec and Huajuapam	45,000.00
Total	151,251,096.68

American capital.—Consul-General Barlow, in his report already mentioned, estimates that about 80 per cent of the total capital invested in railroads in México is represented by American capital. In this connection the Consul-General says:

"All of the important railroads in México (except the Interoceanic, which runs between this city (México) and Veracruz, and was recently acquired by the Mexican Government; the Mexican Railway, which also runs between this city and Veracruz, which is controlled by English capital; and the National Tehuantepec Railway, which is being reconstructed by S. Pearson & Son, of London, under contract with the Mexican Government), are owned by American capital.

"A large amount of American capital has been invested in the railroads of this country within the past two years, the Mexican National Railroad having passed from British to American control, and the Mexican Central, always American, having acquired some short lines which were not owned by American capital. Since the construction of the Mexican Central by Americans, some twenty years ago, United

States capital has always been the strongest factor in Mexican railroads, and at present it constitutes about 80 per cent of the total capital invested in railroads in this country.

"The Mexican Central Railroad represents the largest single American interest in México. The amount, $158,999,979.45, given as the capital employed, represents what has actually been paid out up to the present time for the construction and equipment of the road. The Mexican National is the next strongest, with a capital invested of $107,350,000. This entire amount has not been actually spent on the construction and equipment of the road up to date, but it will be within the next year. * * * The México, Cuernavaca and Pacific Railway has recently been sold to the Mexican Central, but since the transfer has not as yet been made officially, the road is considered in this report as a separate road."

Intercontinental Railway.—The report[a] submitted to the Secretary of State of the United States by Mr. Charles M. Pepper, Commissioner to carry out the resolution of the Second International Conference of American States, held in the City of México in the winter 1901–2, contains most valuable data in regard to the progress made by the intercontinental railway in México. The following information is taken from that important document:

"Under authority of the general railway law the franchise was granted for the line known by its corporate title as the Pan-American Railway, which should start from a point on the National Tehuantepec Railroad and should continue through Tonalá to the border of Guatemala. The point selected was the station of San Gerónimo, which is a few miles northeast of the town of Tehuantepec. The route surveyed to the border of Guatemala was 260 miles (418 kilometers). On January 1, 1904, 88 miles (141.5 kilometers) were constructed, leaving 172 miles (276.5 kilometers) to be built. By the terms of the concession the subsidy is granted in bonds to the amount of $12,000 Mexican silver, bearing 5 per cent interest, for each kilometer constructed, or $3,816,000 for the whole line, and 80 kilometers are required to be built each twelve months. The entire system must be finished by September 11, 1907, but your Commissioner was informed there is a probability that the earnest desire of the Mexican Government for its earlier completion will be gratified. This railway is to be of standard gauge, 4 feet 8½ inches.

"In view of the termination of the Veracruz to the Pacific Railroad, which has placed the City of México in direct communication with the Isthmus of Tehuantepec, including the Pan-American junction point of San Gerónimo, the branch running southeast from

[a] "Pan-American Railway," Senate Document No. 206, 58th Congress, 2d session, Washington, 1904.

Oaxaca, which formerly was considered a necessary part of the intercontinental connection, is not of immediate consequence. It has been extended as far as Ejutla.

"*Progress in building interoceanic lines.*—No less important than the north and south connection are the projects for interoceanic roads which will join Tampico and the other Gulf of México ports with the ports of the Pacific. These are of significance, both from the world commerce in transit which they are expected to handle and from the interior trade which they will help to develop. On January 1 of the present year (1904) there was only one means of through interoceanic railway communication. This was from Veracruz, on the Atlantic, via Córdoba and Tehuantepec, to Salina Cruz, on the Pacific.

"Four other through lines are planned. These are, first, the extension of the road known as the Cuernavaca and Pacific from its present terminus on the river Balsas to Acapulco, probably via Chilpancingo; second, the Mexican Central from Tuxpan to Colima, a distance of 48 miles, from which place a line now runs to the port of Manzanillo; third, the International Railroad from Durango to Mazatlan, 220 miles (354 kilometers), at an estimated cost of $12,500,000 gold; fourth, the Kansas City, México and Orient from Chihuahua to Topolobampo, 435 miles (700 kilometers).

"On the Kansas City, México and Orient line 124 miles (200 kilometers), Chihuahua to Minaca, have been constructed, and 45 miles (72 kilometers), from Topolobampo toward Minaca, also have been built. Work is in progress on the other sections.

"The Cuernavaca and Pacific Railroad is controlled by the Mexican Central, and as that company is extending its main branch from Guadalajara through Tuxpan and Colima to Manzanillo, the probability is that it will first reach the Pacific over this route.

"The extension of the International from Durango to Mazatlán will place New Orleans within 1,300 miles of a Pacific seaport.

"Some of the interoceanic extensions have been deferred temporarily while awaiting the action of the Government in changing the basis of its monetary system, but none has been abandoned.

"*Remarkable railway growth.*—The growth of the Mexican railroads has been one of the marvels of the last quarter of a century. In 1873, when the pioneer line, the Mexican and Veracruz, was concluded, the total extent was 335 miles (540 kilometers). In 1903 there were in operation 9,701 miles (15,612 kilometers) This did not include the horse tramways and the electric and other traction lines in the cities and States. At this date there are approximately 10,000 miles (16,000 kilometers) of railroads in actual operation.

"This remarkable advance is a tribute to the farsighted liberality and the statesmanship of His Excellency Gen. Porfirio Díaz, under

whose successive administrations as President foreign capital has shown its appreciation of the security and stability afforded it and has taken advantage of the profitable returns resulting from developing the enormous natural resources and fostering the commerce of the country."

The report in question is supplemented by an appendix containing statistical tables on Mexican railways prepared for the information of the commissioner under the direction of Mr. Leandro Fernandez, the Minister of Communications and Public Works of México, showing the subsidized and unsubsidized railroads for which concessions have been granted, the work already done, and the distances yet to be covered. From the data submitted it appears that on January 1, 1904, the total of the systems engaged in extensions and new constructions, and parts of which were in operation, was 9,740 miles (15,685 kilometers). The existing concessions include 2,235 miles (3,597 kilometers) of subsidized construction and 3,843 miles (6,188 kilometers) of unsubsidized construction, or in all 6,078 miles (9,785 kilometers). The total amount of subsidies granted by the Government in cash and bonds for the lines now under construction or making extensions is $30,522,000 Mexican silver. A few of the bonds bear interest at 6 per cent, but the larger portion are 5 per cent. In addition to the cash guaranties public lands to the value of $5,136,000 have been granted.

Principal railroads.—The *Ferrocarril Mexicano* (Mexican Railway) was the first steam road built in the Republic. Its construction was begun in 1857, and portions of the line were opened to the public at different times. The Puebla branch was inaugurated in 1869, the main branch being opened for its entire length in 1873 and the Ometusco-Pachuca extension in December, 1890. The total length of the line is 516 kilometers 500 meters, as follows: México to Veracruz, 423 kilometers 750 meters; Apizaco to Puebla, 47 kilometers, and from Ometusco to Pachuca, 45 kilometers 750 meters. It is a standard-gauge road, and runs through the States of Veracruz, Puebla, Hidalgo, and México, starting at the city of Veracruz and passing through the towns of Córdova, Orizaba, Puebla, and Pachuca, its terminal point being the City of México. It is considered one of the most beautiful and picturesque railway lines in the world, passing as it does from tropical vegetation of the valleys to the eternal snows on the summits of extinct volcanoes. From Veracruz to Orizaba the grade of ascent is gradual, skirting the mountains and traversing valleys and canyons. At the latter point the tropical landscapes come to an end and are succeeded by those of the temperate zone, the altitude being 1,200 meters above sea level. The line continues its ascent, climbing the mountains over beds of volcanic formation at dizzy heights, through tunnels, etc., until the semicircular viaduct of "El Infiernillo" is reached, which is

considered one of the boldest and most remarkable engineering feats of modern times. At this point the altitude reached is 2,450 meters above sea level, the line passing into the cold zone, and after a few hours' run the traveler enters the Central Plateau. The rapid descent of Maltrata, the grade being 4 per cent, necessitates the use of double locomotives of the Farlie system for the safety of the trains. From 1893 to December 31, 1902, the Mexican Railway carried 7,877,413 passengers and 7,002,103 tons of freight, the total earnings of the line being $39,058,626.[a]

Ferrocarril Central Mexicano.—The Mexican Central Railway is the result of the amalgamation of different Government concessions granted originally either to the company now in control of the line or to others. Work on the main line, from México to Paso del Norte, was commenced on May 25, 1880, and completed March 8, 1884, the total extent being 1,970 kilometers, which indicates a per diem labor rate of 1,500 meters. The expenses of construction are estimated at $35,500,000, of which amount the Government contributed $18,620,000. This is the longest and most important road in the Republic, having connections with the United States and thereby facilitating trade, while at the same time it protects the States of Chihuahua and Sonora from the depredations of certain Indian tribes and assists in the development of the mineral wealth of the "Sierra." The total length in working condition was, on December 31, 1902, 3,734 kilometers 483 meters.

The road was opened to regular passenger traffic on the 10th of April, 1884. The Guadalajara division was opened May 21, 1888, and the Tampico division was finished March 30, 1890, thereby bringing the line to the Gulf of México at Tampico. The railway is standard gauge, and traverses the Federal District, the States of México, Hidalgo, Querétaro, Guanajuato, Jalisco, Aguascalientes, Zacatecas, Coahuila, Durango, and Chihuahua. It affords an outlet to the agricultural centers of San Juan del Rio, Penjamo, Silao, the extensive territory called El Bajio, and Lagos; to such manufacturing cities as Querétaro, Celaya, and Leon; to the rich mining districts of Pachuca, Zimapán, Guanajuato, Zacatecas, Sombrerete, Sierra Mojada, and Chi-

[a] The Mexican Railway connects in México City with the Mexican Central and Mexican National for northern and western points and with the Interoceanic Railroad for Morales; in Puebla, with the Mexican Southern for Oaxaca, Puerto, Angel, and Tehuantepec, and with the Interoceanic for Izucar de Matamoros; in San Marcos, with the Nautla Railroad for San Juan de los Llanos; in Esperanza, with the Tehuantepec Railroad; in Córdova, with the Agricola Railroad for Motzorongo and Tuxtepec; and in Veracruz, with the Alvarado Railroad for Tlacotalpam, San Andrés, Tuxtla, Cosamaloapan, and Playa Vicente, and with steamship lines for Mexican Gulf ports, namely, Progreso, Campeche, Carmen, Frontera, Coatzacoalcos, Tuxpám, and Tampico, and for Habana, and American, English, Spanish, French, and German ports.

huahua; to the cotton country in the valleys of the rivers Nazas and Conchos, and to the commercial centers of México, Guadalajara, Aguascalientes, San Luis Potosí, and Tampico.[a]

From 1893 to December, 1902, the Mexican Central carried 15,594,405 passengers, the receipts from this branch of the service being $37,445,255; also 16,064,885 tons of freight, which produced $110,040,099, or a total for the period under consideration of $147,485,354.

Ferrocarril Interoceánico.—The Interoceanic Railway is the result of a concession to build a road connecting Veracruz and Acapulco (hence its name Interoceanic), which was granted by the Mexican Government in April, 1878. In 1902 the length of the line was 778 kilometers. From 1893 to December 31, 1902, the earnings of the road were as follows: Passengers, 9,856,388, which produced $6,103,408; freight, 5,181,776 tons, producing $25,525,993, or a total of $31,629,401.[b]

Ferrocarril Nacional Mexicano.—The Mexican National Railroad was inaugurated on November 1, 1888, but its construction had been under consideration since 1857. It is the shortest route between México and the United States. This road traverses United States territory for a distance of 260 kilometers 700 meters from Laredo

[a] The Mexican Central connects at El Paso with the Atchison, Topeka and Santa Fe; for all points northeast and west with the Texas and Pacific; with the Southern Pacific for points north and east; with Southern Pacific Company and the Atchison, Topeka and Santa Fe for points north and west in the United States; at Gallego, with stage for Ascencion, Casas Grandes, and Corralitos; at Chihuahua, with stage for Cusihuiriachic, Guerrero, and Rosario; at Jimenez, with stage for Allende and Parral; at Escalón, with Mexican Northern Railway for Sierra Mojada; at Torreon, with the Mexican International for Durango, Monterey, and Tampico, via the Mexican Gulf Railway; at Fresnillo, with stage for Sombrerete; at Zacatecas, with Sullivan Construction Railway for Ojo Caliente, with tramway for Guadalupe, and with stage for Jerez; at San Luis Potosí, with the Mexican National for Catorce Mines, Saltillo, Monterey, and San Miguel Allende; at Tampico, with steamers for Galveston, New Orleans, Mobile, New York, and European ports; at Celaya, with Mexican National for points north and south of that road; at Negrete, La Barca, and La Piedad, with stage for Zamora; at Guadalajara, with stage for Mazatlán, Tepic, and Zapotlán; at El Castilo, with tramway for the falls of Juanacatlán; at Atequiza, with stage for Lake Chapala; at the City of México, with the Mexican Railway and Interoceanic Railway for Puebla, Cholula, Orizaba, Veracruz, Jalapa, Cuautla, Oaxaca via Mexican Southern; with the Hidalgo Railway for Tulancingo; at Huachinango, with the Mexican National for Toluca, Morelia, and Lake Patzcuaro, and with stage for Cuernavaca.

[b] This line connects at the City of México with Mexican Central and Mexican National railroads for points north and west; at Otumba, with Mexican Railway; at Irolo, with Hidalgo Railway for Pachuca; at Puebla, with Mexican Southern for Oaxaca, with Mexican Railway for Tlaxcala, and with Industrial Road (animal traction) for Cholula and San Marcos with the Nautla Railroad and Mexican Railway; at Jalapa, with tramway for Coatepec; at Veracruz, with Mexican Railway for Alvarado, and with steamers for Gulf ports, Habana, United States, and Europe; at Compañía, with tramway for Chalco; at Yautepec, with private conveyance for Cuernavaca; at Jojutla, with stage for principal towns in the State of Guerrero.

(Texas) to Corpus Christi, the terminus of the line. From 1893 to 1902 the total earnings of the road were as follows: $11,337,559 for passengers, and freight, $49,145,767, a total of $60,483,326; the number of passengers being 8,513,991 and the freight weighing 8,904,854 tons.[a]

A report of this road dated March 27, 1903, gives the following data for 1902: The gross earnings from all sources for the year 1902, in Mexican currency, were $9,262,859.61; the total expenses of operating were $6,048,684.07, leaving the net earnings $3,214,175.54, which, reduced to gold at the average price of the Mexican dollar for the year (41.3314 cents), gives $1,329,428.38.

The gross earnings per mile of road operated were $6,862.70, as compared with $5,837.23 in 1901, the percentage of increase being 17.57. The operating expenses per mile of road operated were $4,481.37, as compared with $3,628.25 in 1901, the percentage of increase being 23.51. The net earnings per mile of road operated were $2,381.33, as compared with $2,208.98 in 1901, the percentage of increase being 7.80. Average miles operated in 1902 were 1,349.74, as compared with 1,323.32 in the preceding year.

Upon the completion of the new line between Huehuetoca and Gonzalez the track mileage will be as follows: Texas Mexican Railway, controlled by ownership of all its securities, Corpus Christi to Laredo, 161.620; International line from Laredo to Santiago station, City of México, 802.311; City of México, Colonia station, to Tacuba, three-rail track, 2.979; Cintura line, three-rail track, 3.293, making a total of standard gauge of 970.203 miles. The trackage of the narrow-gauge system is as follows: City of México to Uruapan, 320.826 miles; Acámbaro to Gonzalez, 54.959; Vanegas, Cedral, and Matehuala, 37.282; Guanajuato, San Luis de la Paz, and Pozos, 31.441; Michoacán and Pacific (leased line), 56.927, making a total of narrow-gauge line aggregating 501.435 miles. The total mileage, both standard and narrow gauge, is 1,471.638, not including the narrow-gauge line from Matamoros to San Miguel de Tamaulipas (75 miles) and the Brownsville and Gulf line of 1 mile. The company has a very favorable concession from the Mexican Government for building the line from San Miguel to Monterey, which it is proposed to construct standard gauge, and in connection therewith to broaden the gauge of the existing line

[a] The connections of the Mexican National are at Laredo, for points north and east in the United States; at Matamoros, with the Mexican Gulf Railway for Venadito, Montemorelos, and Tampico; at Vanegas, with Vanegas, Cedral and Rio Verde Railroad for Cedral and Matehuala; at San Luis Potosí with Mexican Central for Aguascalientes and Tampico; at Celaya, with same road for Guanajuato and Guadalajara; at Maravatío, with Michoacán and Pacific Railroad for Anganguéo; at Toluca, with San Juan Railroad for Valle; at México City, with the Hidalgo, the Interoceanic, and the Mexican for Pachuca, Puebla, Veracruz, Jalapa, Orizaba, and Cuautla Morelos, and other lines recently acquired.

between Matamoros and San Miguel, which will make the total distance from Matamoros to Monterey approximately 232 miles. The mileage above noted does not include that of the Mexican International Railroad (880 miles), control of which was acquired by obtaining $15,786,100 of the capital stock out of a total issue of $20,708,200 and the total issue of income bonds, $4,449,000, which was paid for by the issue of $7,000,000 preferred stock and $7,000,000 4 per cent consolidated bonds of the new company, as provided for in the readjustment plan.

The following concession has been granted the National Railroad Company:

"During a period of twenty years, from October 31, 1903, the Government will not grant to any person or corporation other than the National Railway Company of México, its assignees, successors, or lessees any right, privilege, or concession to construct, maintain, or operate any railway line of any kind whatever in a zone extending along the northeastern frontier of México and the United States, said zone being bounded on the northeast by the Bravo River (Rio Grande del Norte) and on the southwest by a line drawn at a distance of 50 kilometers from said river and parallel thereto in that part of its course which is comprised between the Gulf of México and a meridian passing through a point situated upon said Bravo River 100 kilometers, measured along the bed of the river, to the northwest of Ciudad Porfirio Diaz, in the State of Coahuila."

The concession to which the foregoing refers is granted subject to the following conditions:

The company will complete, construct, and equip its line from Monterey to Matamoros within three years from January 1, 1904. If on January 1, 1907, said line is not completed, constructed, and equipped, the concession will be forfeited.

Other concessions may be granted within the said zone, provided that the lines to be constructed and operated are only branches or local routes connecting solely with the main lines of the National Railway Company of México.

At the request of the National Railway Company the Government will consent to the consolidation, both as to control and operation, of the National, Interoceanic, and International railway systems.

Ferrocarril Internacional Mexicano.—The Mexican International Railway is a standard-gauge railway, an extension of the Southern Pacific. It is the only trunk line built in México with United States capital without a subsidy. Believing that a road from the Rio Grande toward the Pacific Ocean would cross a section of the Republic of México susceptible of great development, this company obtained certain concessions in 1881, modified in 1882 and 1883, and work was immediately commenced at Ciudad Porfirio Díaz and the Lampazos branch, thereby reaching the coal fields of San Felipe. The track of

the main line to Torreón was completed January 12, 1888, and the operation of the road was commenced two months later. The San Pedro branch was built in 1890, and the main line was completed October 1, 1892, to Durango, the capital of the State of Durango. This road traverses the States of Coahuila and Durango, and will extend through Sinaloa to reach Mazatlán, on the Pacific coast. It touches Eagle Pass, Allende, Sabinas, Monclova, Treviño, Jaral, Paila, Torreón, Durango, and other points.

From 1893 to 1902 the total earnings of this road amounted to $37,852,435, divided as follows: Passengers (1,552,274), $4,320,692, and freight (5,517,129 tons), $33,531,743. The total length in operation in 1902 was 1,416 kilometers 680 meters.[a]

Ferrocarril de Monterey al Golfo Mexicano.—The Monterey and Mexican Gulf Railway is the property of the National Railway Company, but the original grant of November 10, 1887, was made to an American company, which built the line. It extends from Treviño (formerly Venadito), in the State of Coahuila, on the International line, as far as Tampico, on the Gulf of México, a distance of 624 kilometers 640 meters, passing through Monterey, the capital of Nuevo Leon, and Ciudad Victoria, in Tamaulipas. This road connects at Treviño with the International for Torreón, Durango, and points north; at Monterey with the Mexican National for points north and south on that line; at Tampico with the Mexican Central for San Luis Potosí and Aguascalientes, and with steamers for Gulf ports, the United States, Cuba, and Europe.

The earnings of the road since 1893, up to December 31, 1901, were $10,555,190, divided as follows: Passengers (1,073,608), $1,315,445, and freight (2,024,230 tons), $9,239,745.[b]

Ferrocarril de México á Cuernavaca y el Pacífico.—The México, Cuernavaca and Pacific Railway has a total operating length of 292.50 kilometers, the concession for its construction dating May 30, 1890. The first division, from the capital to Cuernavaca, a distance of 119 kilometers, was opened to traffic on December 12, 1897. Beyond Cuernavaca there is a branch line, 40 kilometers long, connecting Puente de Ixtala, Iguala, and Mexcala. From 1895 to 1901[c] the move-

[a] Connections: At Eagle Pass, with the Southern Pacific Company for all points in the United States; at Allende, with stage for Zaragoza; at Sabinas, with stage for San Juan de Sabinas; at Felipe, with stage for Juarez and Progreso; at Berroterán, with stage for Villa de Musquíz (Santa Rosa); at Monclova, with stage for Cuatro Ciénegas and Sierra Mojada; at Treviño, with the Mexican Gulf Railway for Monterey, Tampico, and points on the National; at Jaral, with stage for Saltillo, the capital of the State of Coahuila; at Paila, with stage for Parras; at Hornos, with stage for Viesca; at Torreón, with the Mexican Central Railway for all points on that line and its connections.

[b] Data for 1902 included in report for the National Railway.

[c] Data for 1902 included in report for the Mexican Central.

ment of the line is represented by 331,266 passengers and 701,663 tons of freight, the total earnings being estimated at $2,214,869, of which $425,454 is for passengers and $1,789,414 for freight.

Ferrocarril Nacional Interoceánico de Tehuantepec.—The National Interoceanic Tehuantepec Railroad is destined to be one of the most important in the Republic. The project was to build across the Isthmus of Tehuantepec and connect the Atlantic and Pacific oceans.

The idea of a highway for this purpose is very old, dating from the time of Cortés. Surveys and plans have been made from time to time, but those of Captain Eads take the first place. The first serious efforts to realize this great work began in 1879, when an American company obtained a concession; but, unfortunately, the company was declared bankrupt in 1882. In 1883 the Mexican Government undertook to build the road and laid rails for a distance of some 40 kilometers. In 1889 and 1890 about 100 more kilometers of rails were laid under the McMurdo contract, and it was supposed that there remained only 100 kilometers more to build. In 1891 the McMurdo concession was rescinded and a new contract was made with Stanhope, Corthell & Hampson. By virtue of the authorization which Congress gave the Executive in the year 1895, a contract was entered into with Stanhope & Corthell for the completion of the road.

The total length of the line from Coatzacoalcos on the Gulf to Salina Cruz on the Pacific measures 309 kilometers 617 meters. The Government, pursuant to the authority of Congress, has recently leased the road to S. Pearson & Son, of London, for fifty years. The firm contracts to build two harbors, one at Coatzacoalcos and the other at Salina Cruz and to rebuild and repair the railroad. The Government guarantees 6 per cent on whatever investment is made in the work, the excess over this percentage reverting to the Government. The firm is to exploit the harbors for its own benefit. At the expiration of the fifty years the line, together with the harbors, will again become the property of the Government.[a]

Ferrocarril del Rio Grande, Sierra Madre y el Pacífico.—The Rio Grande, Sierra Madre and Pacific Railroad is a new road built entirely by New York capital under a grant bearing date of March 24, 1896. It runs from Ciudad Juarez (Chiahuahua) to the southeast part of the Republic. Ground was broken for the inception of the line on August 15, 1896, and the first passenger train ran over the completed line to Casas Grandes, a distance of 250 kilometers, on June 27, 1897. The cost of construction was $8,400 per English mile, and other expenses,

[a] The road traverses the States of Veracruz and Oaxaca, touching Coatzacoalcos, Minatitlán, Suchil, Tehuantepec, and Salina Cruz. At Coatzacoalcos it connects with steamers for Gulf ports, Habana, United States, and Europe; at Tehuantepec with private conveyance for Oaxaca, Miahutlán, and Pachutla, and at Salina Cruz with steamers for Tonalá, San Benito, and other Pacific coast ports.

such as right of way, equipment, telegraph lines, etc., amounted to about $2,475 more. The total length of the line measures 256 kilometers 575 meters. The earnings of the road from 1897 to 1902 were $1,474,869, of which $242,163 were for passengers and $1,232,705 for freight.

The "Anuario Estadístico" for 1902 gives a list of 90 railways, including those already mentioned, whose combined length is 15,137 kilometers 505 meters. There are besides many other minor lines, too numerous to mention, and new concessions are being granted every day.

Federal District.—The railways in the Federal District show earnings to the amount of $17,195,144 for the period between 1893 and 1902, divided as follows: Passengers (220,163,684), $14,621,954, and $2,573,189 from other sources. There are two systems of traction used in the district, animal and electrical, representing the city, suburban and other lines, with a total length of 239 kilometers 883 meters. The report of the México Electric Tramways (Limited) for 1902 shows that the total distance operated on by electricity under the company's system is 116 kilometers. During the year 311,132,030 passengers were carried, as against 26,709,225 passengers during the previous year (1901), being an increase of 4,422,805 passengers, and the receipts amounted to $2,400,787.83, as against $2,103,174.87 in 1901, showing an increase of $297,612.96. The increase in prices of material and rise in wages as a consequence of the lower exchange during the past year as against the previous year may be taken, at a moderate estimate, at about 20 per cent. Traffic receipts since the beginning of January, 1903, have shown a steady increase.

Railroad traffic with the United States.—According to statistics issued by the Treasury Department of the Republic of México, the railway traffic across the Rio Grande between México and the United States during the fiscal year 1902–3, as compared with 1901–2, was as follows:

	United States to México.		México to United States.		Total traffic.	
	Freight cars	Merchandise.	Freight cars.	Merchandise.	Freight cars.	Merchandise.
		Tons.		*Tons.*		*Tons.*
1901–2	37,307	517,749	14,130	199,276	51,437	627,025
1902–3	37,379	704,958	18,737	207,514	56,116	912,472
Increase in 1902–3	72	187,209	4,607	98,238	4,679	285,447

The distribution of this traffic at the points where the railways cross the Rio Grande on the frontier line was:

Ciudad Juarez.—7,729 cars, with 123,664 tons of merchandise, from the United States into México; 2,506 cars, with 40,276 tons of merchandise, from México into the United States, making a total traffic of 10,235 cars, with 163,940 tons of merchandise.

Ciudad Porfirio Diaz.—9,182 cars, with 138,371 tons of merchandise, from the United States into México; 8,386 cars, with 23,236 tons of merchandise, from México into the United States; total traffic, 17,235 cars, with 161,607 tons of merchandise.

Laredo.—18,138 cars, with 228,800 tons of merchandise, from the United States into México; 1, 304 cars, with 15,749 tons of merchandise, from México into the United States; total traffic, 19,442 cars, with 244,549 tons of merchandise.

Nogales.—2,258 cars, with 26,914 tons of merchandise, from the United States into México; 1,934 cars, with 30,015 tons of merchandise, from México into the United States; total traffic, 4,192 cars, with 56,929 tons of merchandise.

The railway traffic across the frontier in the three fiscal years from 1898–99 to 1900–1901 is shown in the following statement:

1898–99.—Cars from the United States into México, 32,305, with 467,839 tons of merchandise; cars from México into the United States, 15,506, with 288,412 tons of merchandise; total traffic, 47,811 cars, with 756,251 tons of merchandise.

1899–1900.—Cars from the United States into México, 47,529, with 645,953 tons of merchandise; cars from México into the United States, 24,471, with 242,550 tons of merchandise; total traffic, 72,063 cars, with 888,503 tons of merchandise.

1900–1901.—Cars from the United States into México, 38,629, with 535,640 tons of merchandise; cars from México into the United States, 20,368, with 223,720 tons of merchandise; total traffic, 58,997 cars, with 759,360 tons of merchandise.

RAILROAD LAW.

The general railroad law of the Republic,[a] whereby those of December 25, 1877, and December 16, 1881—with the exception of those clauses relating to the acquirement of telegraph and telephone lines by the Government—are repealed, was promulgated April 29, 1899. The law, which is one of considerable length and containing 16 chapters and 187 articles, is intended to cover everything connected with the granting of concessions, each concession having formerly been the occasion of a special law. This general law will hereafter apply both to new concessions and to those previously granted, the terms of which shall not conflict with the law. It also increases the difficulties of obtaining subsidized concessions and emphasizes the control exercised by the Government over companies.

[a] For the convenience of persons wishing to familiarize themselves with the full text of the law, it is kept on file, both in Spanish and English, at the Columbus Memorial Library, International Bureau of the American Republics.

Chapter I of the new law is devoted to the classification of railroads subject to the Federation, which are divided into two classes, viz:

I. General routes of communication.

II. Routes of local interest in the Federal District and in the Territories.

III. Routes of local interest in the State.

To the first class belong those connecting two or more States or connecting the Federal District or a Territory with one or more States; those touching at a port or at some point on the coast of the Republic or at some point on the border line with a foreign State, and those running wholly or in part within a zone of 100 kilometers from the dividing line with a foreign State.

To the second class belong the railroad lines connecting two or more towns of the Federal District or of a territory with one another, and those which, while not connecting two or more towns by entering to their center, have one of their terminals on the outskirts of a town.

Railroads built or projected within the territory of a State, whether under a State concession or not, shall be classed as routes of local interest subject to the Federation, providing that the concession has been granted by the Federation, or that a subsidy, exemption from duties, release from taxation, or any other aid has been granted by the Federation.

General routes of communication are subdivided into lines of prime and secondary importance, the lines of prime importance being:

I. A line connecting the city of Chihuahua with a port on the coast of Sonora or the north of Sinaloa.

II. A line connecting the City of México with a port in the State of Guerrero.

III. A line connecting the Mexican Railway between Orizaba and Veracruz with the Tehuantepec Railroad.

IV. A line from Guadalajara to Tepic Mazatlán.

V. A line from Guadalajara or some other point and the Mexican Central to Colima and Manzanillo.

VI. A line connecting the Tehuantepec National Railroad with the frontier of Guatemala.

VII. A line connecting the Tehuantepec Railroad with the States of Tabasco and Campeche.

VIII. Any other line which, in the opinion of the Department of Communications and Public Works, is of general interest and its construction an urgent necessity, provided the requirements of the law are complied with.

The construction of railroads subject to the Federation shall be carried out by corporations or private individuals under concessions to be granted by the Executive of the Union, subject to the provisions of the

law. Private persons to whom concessions are granted are empowered to form companies, the same rule being applicable to corporations.

In order to obtain a concession for the construction of a railroad the petition must be made to the Department of Communications and Public Works, setting forth the following points:

I. The terminals of the road and the intermediate points at which it touches, either directly or by means of branches.

II. The period within which the survey of the road is to begin.

III. The minimum number of kilometers to be built annually.

IV. The period within which the road is to be completed.

V. The schedule of maximum rates to be charged for the transportation of passengers and merchandise, for express and baggage, for telegraph service, and for the use of the track by other lines.

VI. Any other facts that may be deemed expedient.

After the proposition has been accepted, with the modifications deemed proper by the Department and the terms of the contract have been agreed upon, the applicant shall make a deposit in the general Treasury of the Federation at the rate of $150 per kilometer in securities of the consolidated public debt. If this provision is not complied with, the application shall be regarded as having been withdrawn and a declaration to that effect shall be made by the Department of Communications and Public Works, without subsequent appeal.

After the deposit has been made the contract will be signed and made public in the "Diario Oficial," the date of publication being the point of reckoning for all periods named in the document, unless otherwise specified.

Concessions for the lines of prime importance which have not been granted, or which having been granted shall lapse in the future, can only be granted to the companies which, besides the requirements already expressed, shall present proof covering the following points:

I. The existence of the company and its organization in conformity with the laws of the country whence the document in regard to its organization proceeds. This proof, if the company has been organized in the Republic, shall be furnished by means of a certified copy of the draft (minuta) of the articles of association, which shall be raised to the rank of a public instrument in case the concession is granted; and if the company has been organized abroad, by the presentation of the documents required by article 24 of the Code of Commerce[a] and

[a]Article 24 of the Code of Commerce provides that "foreign companies desirous of establishing themselves or their branch offices in the Republic shall present and file in the register's office, besides the proofs of the protocolization of their statutes, contracts, and other documents referring to their organization, their inventory or last balance sheets, if they have any, and a certificate showing that such companies have been duly organized and authorized in accordance with the laws of their respective countries. This certificate must be given by the Mexican minister residing at the respective places, and in his absence, by the Mexican consul.

in case the concession is granted such documents need only to be protocolized, registered, and stamped.

II. That the company has, either on hand or assured, the subscription and payment of the capital necessary for the survey of the land, the preparation of plans, and the fulfillment of the obligations set forth in the law.

If the proposition is accepted, the procedure shall be as stated above, but the deposits shall be at the rate of $200 per kilometer in securities of the consolidated public debt.

The construction of other lines shall be subject to bids, as provided by law.

Railroad concessions carry with them the following rights:

I. The right to construct the railroad.

II. The right to build a telegraph and telephone line.

III. The right to exploit the railroad and the telegraph or telephone line for the entire period of the concession.

The telegraph or telephone line built under the concession can only be exploited for the service of the road, of passengers traveling thereon, and of shippers or consignees of freight on matters connected with their business with the road. The telegraph line can not be operated in any other manner nor on other service, except with the authorization of the Department of Communications and Public Works, which at all times shall have the right to revoke the authorization granted.

The system of traction to be used shall be set forth in the concession.

Railroads constructed within the territory of a State and not coming under either of the classes mentioned shall, from the moment they join or connect with a road under the Federation, become subject to all Federal laws and regulations, as provided by law.

The deposit that is made guarantees the performance of the obligations contracted by the concessionaire, and shall be returned to him when all the works covered by the concession have been completed. Until such time as the deposit is returned, and unless it has been forfeited, the interest coupons shall belong and shall be delivered to the concessionaire.

Concessions may be transferred wholly or in part to other companies or individuals, with the consent of the Department of Communications and Public Works, according to the provisions of the law.

Under no circumstances can the company transfer, mortgage, or in any other manner dispose of a concession or any of the rights which it carries, or of any of the property or belongings connected with said line, to a foreign Government or State, and any sale, assignment, transfer, or mortgage infringing this rule shall be null and void. A company may not allow a foreign Government or State to become a partner, and any agreement infringing this rule shall likewise be null and void. All shares, securities, or bonds issued by the company and

acquired by a foreign Government or State shall, from the moment of such acquisition, be deprived of all force and value for their holder, who shall forfeit to the nation all the rights attached to such shares, securities, or bonds.

Concessions for railroad lines shall not be granted for a term exceeding ninety-nine years. At the close of this period the railroad, with all its appurtenances, shall pass, in good condition and free from all incumbrance, into the control of the nation; but the Government must purchase the rolling stock, appliances, chattels, and equipment that may be necessary to continue the operation of the road, paying in cash the price of valuation by appraisers appointed as provided by the law. The Government shall be entitled to the earnings of the railroad during the five years preceding the date of the reversion, to be employed for the benefit of the road in case the company fails to comply with the provisions regarding its transfer in good condition.

No railroad concession implies a monopoly for the benefit of the concessionaire, but a stipulation may be introduced into concessions to the effect that within ten years no other concession shall be granted for a line parallel to the former, wholly or in part within a territory of a width to be determined on both sides of the road, or that no subsidy, exemption from taxes, or other franchises shall be allowed to lines for the construction of which within said territory a concession may be granted.

The Executive of the Union, in compliance with this law, may at all times and in concert or under an agreement with the companies, add to, modify, or rescind existing railroad concessions.

A concession shall lapse for any of the following reasons:

I. Failure to commence the surveys within the time specified.

II. Failure to construct, in a year, the number of kilometers required by the concession, or to complete the line within the period allowed by said concession.

III. The total or partial interruption of the public service of the road, save in the case of fortuitous or unforeseen circumstances, as defined by law.

IV. The sale of the concession or of any of the rights granted by it to a company or individual, without the previous consent of the Department of Communications and Public Works.

V. The transfer, sale, or mortgage of the concession, or of any of the rights conveyed, or any of the properties attached thereto, to a foreign Government or State, or the admission of such a partner in the enterprise.

In order that the circumstance may be declared to be fortuitous, the company must present to the Department of Communications and Public Works, within three months from the occurrence, a written statement, detailing the event and showing proof thereof, as provided by

the law. The Department of Communications and Public Works, in view of the company's statement, shall decide whether or not the concession is thereby forfeited. If the decision rendered is in favor of the company, an extension of time, at the discretion of the Government, shall be allowed in which the company may fulfill the obligations entailed by the concession.

The concessionaires are entitled to enter into contracts with other individuals or companies for the construction of the road, but these contracts shall have no recognition from the nation until they are submitted to the examination and approval of the Department of Communications and Public Works. Failure to comply with this does not entail a forfeiture of the concession, but the constructing company and the concessionaire shall be considered as one and the same for all legal purposes connected with the nation; and for all such purposes, as well as for all business appertaining to the construction of the road and the concession in which the nation has an interest, only the original concessionaire shall be recognized.

Whenever a concession if forfeited, the concessionaire shall lose his deposit, which reverts to the nation. When the concession is forfeited for any of the causes mentioned in Paragraphs I and II, above, the company shall preserve the right of ownership of the buildings it may have erected, the portion of the railroad and telepragh line it may have built, and to the materials, machinery, and utensils employed in the operation of the road, according to the law.

In the event of the public service of a railroad being interrupted, wholly or partially, the Department of Communications and Public Works shall, at once and at the expense of the company, take steps to assure its continuance provisionally, as provided by this law. In the event of forfeiture for the cause mentioned in Paragraph IV, the company shall lose the right to operate the railroad, telegraph, and telephone line, the Government succeeding to that right and entering into possession of the line and its appurtenances, a receiver being appointed, as provided by the Code of Commerce, and the operation of the line continued under Government auspices. The next step will be the judicial sale, at public auction, of the property mentioned, and the Executive shall determine the conditions under which the sale is to take place.

In the case of forfeiture for the cause mentioned in Paragraph V, the company shall forfeit to the nation the portion of the road already constructed, but the nation will be liable for the mortgage and other debts contracted prior to the declaration of forfeiture, to an extent proportionate to the value of the property. Within six months from the time that the Executive takes possession of the property, it shall decide whether the nation shall assume the responsibility mentioned and undertake the administration of the road.

The declaration of forfeiture shall be made through the administrative channel by the Executive, after the company has been heard, for which purpose it shall be allowed a specific period to give such explanation as may be deemed pertinent. At the expiration of this period, the Executive shall, if deemed necessary, make further inquiries and announce its decision. As soon as the concession of a railroad is declared to have been forfeited all the privileges and exemptions granted by the concessions shall cease.

A declaration of forfeiture can only be contested before the courts for one of the following reasons:

I. That the reason adduced does not constitute a legal ground for a declaration of forfeiture.

II. That the fact or omission adduced as a reason for forfeiture is not as stated.

If the declaration of forfeiture is not contested before a competent court within the period of one month from its communication to the company, it will be assumed that the company acquiesces in the decision of forfeiture, and no further action will be taken.

Railroads may, in the concessions, be divided into several sections, so that the forfeiture of some will not affect the continuance of others, and each section between its terminal points must be considered as a separate line, to be operated independently.

In cases where there is no ground for a declaration of forfeiture, but where there is sufficient ground for annulment of the concession, the deposit above mentioned shall be forfeited, but during the suit, and until the final sentence of annulment is rendered, the company shall continue to enjoy all the rights appertaining to it under the concession, without detriment to provisional and precautionary measures, when, according to law, there is occasion for them.

As regards the nationality and legal status of companies, those whose object is to construct or to operate, or to construct and operate a railroad, may be organized in the Mexican Republic or abroad; but under all circumstances such companies shall be regarded as Mexican, even though the entire organization is foreign. Said companies shall be subject to the courts of the Republic, whether Federal or local, in all matters coming under the jurisdiction of the courts, and foreigners and their successors who shall be interested either as shareholders, employees, or in any other capacity, shall in all cases be regarded as Mexicans in so far as the companies' affairs are concerned. On no pretext whatever may rights as foreigners be urged with respect to titles (*títulos*) and affairs connected with the companies, and only such rights and the means of enforcing them shall be enjoyed as are granted by the Mexican law to citizens of the Republic; consequently foreign diplomatic agents may not interfere in any way.

Companies shall have one or more attorneys in the capital of the

Republic, who shall be empowered to deal with the Federal authorities and other public officers in all matters relating to the concessions, but the headquarters of all companies shall be at the town named in the concessions, this, however, not preventing the establishment of agencies in different parts of the country or abroad.

In cases when the board of directors of railroad companies reside abroad, a local board, resident at the headquarters of the company within the Republic, or at such place as shall be designated in the concession, shall be appointed, which board shall be regarded as part of the board of directors.

For the issuance of shares and bonds, the following rules shall be observed:

I. After the plans and profiles have been drawn up, an estimate shall be made on the cost of the entire work.

II. On the basis of that estimate and of the rights of the concessionaire, the capital in shares and bonds shall be determined with the approval of the Government.

III. The provisions of the foregoing paragraph do not prevent, pending the preparation of the estimates, the issuance of shares and bonds or the acquisition of funds by any other means for the construction of the road.

IV. The amount of the capital in shares and bonds may be increased, even after the preparation of the estimate and after the capital has been fixed, provided that the necessities of construction or operation require it.

V. The right to issue shares and bonds does not imply that by these means alone the company may obtain funds, as to that end all legal methods may be employed.

VI. The company is obliged to inform the Department of Communications and Public Works of all the steps taken and all the contracts entered into pursuant to the rights conferred on it by this article.

All contracts entered into abroad are subject to the laws of the Republic, as provided by this law. Contracts for the acquisition of material for the equipment of the railroad and rolling stock are subject to special regulations.

Railroads, being works of public utility, are in consequence entitled to condemn (expropriate) land and construction material belonging to private individuals which may be necessary for the establishment and repair of the road and its appurtenances, stations, and other annexes. This, however, does not include the right of condemnation of water rights, without special authorization in each case by the Executive. The process of condemnation is subject to certain regulations, as prescribed by the law.

In the matter of franchises and exemptions granted to concession-

aires, the law provides that foreign capital employed in the construction and operation of railways, and the loans contracted for that purpose, be placed under the guardianship of the nation and are exempt from reprisal, confiscations, and attachments in case of war. The capital and property of a railroad company shall be exempt from all Federal and local taxation save the stamp tax, provided they are applied directly to the purposes set forth in the concession. The stamp tax applies only to the documents, acts, contracts, and transactions to which the company is a party. The general routes of communication, their appurtenances, the capital, shares, bonds, etc., employed, shall at no time be taxable by the States of the Federation.

A company may import, free of all import and custom dues, all fixed material for the line, rolling stock, telegraphic materials, cars, etc., necessary in the construction and operation of the line, also for maintenance and repairs of the railroad and telegraph line, for a period not exceeding five years, said articles also being exempt from all taxes, whether Federal or local, for a like period. If any of these materials shall be sold or applied to other uses, the Department of Finance shall exact the payment of the duties, subject to the provisions of the law.

The lines of prime importance may be subsidized; and in certain cases, as provided by law, other lines also. Subsidies shall be subject to the following rules:

I. No subsidies for the construction of railroads shall be granted when the payment of said subsidies can not be covered by the budget appropriations available for that purpose, except in the cases provided by law.

II. The subsidy shall be paid with respect to sections of at least 100 kilometers, constructed and accepted by the Department of Communications and Public Works, in the amount and according to the conditions to be determined in each particular case, except that if when the line is completed its last section measures less than 100 kilometers the amount appertaining to that section shall be paid upon its completion.

III. The subsidy shall be paid in bonds of the public debt, the Executive reserving the right of deciding in each case in which of the two following forms payment is to be effected:

(*a*) In 5 per cent bonds of the redeemable debt.

(*b*) In bonds of other descriptions, according to the conditions and terms to be determined.

Land belonging to the nation and needed by the company shall, with the approval of the Executive, be made over to the company without any payment whatever. The company shall also be entitled, under the same conditions, to take from lands belonging to the nation and from its rivers, all materials that may be necessary for the construction, operation, and repair of the road and its appurtenances, but

in taking out such material the company is subject to the laws and regulations bearing upon the case.

If the road terminal be at a seaport the company shall be entitled to build one or more wharves, subject to the rules and conditions determined in the concession. Deposits and other mineral substances which, according to the mining law, do not belong to the owner of the soil, and which may be found during the construction of a railroad, shall be the property of the company, provided it is denounced within three months from the date of discovery.

Officials and employees of railroad lines are exempt from military service, except in case of foreign war.

Railroads shall be constructed in accordance with the provisions of the railway ordinances now in force or to be issued in the future.

The policy of a road, as expressed in its laws and regulations, shall provide suitable measures for its maintenance and safety, but no railroad can be put into operation without having been previously inspected as provided by the ordinances, and accepted by the Department of Communications and Public Works.

The tariffs of railroad transportation shall include the rates for which transportation shall be effected, and the conditions according to which companies bind themselves to perform this service according to the provisions of the law. General regulations governing the transport of passengers and freight, and the liability of railroad companies for possible damages sustained thereby, are fully covered by Chapter VII of the law. In return for the concession to construct railroads the nation reserves certain privileges or rights, touching reduced tariff rates for the transportation of colonists and immigrants, employees, agents, and officials traveling on public business; for the transportation of troops, ammunition, etc.; the transmission of telegraph messages; the free transport of mail and mail officials; the use of special trains at any time, and certain other privileges as set forth in the law.

On all railroads the Executive possesses the right of inspection, exercised either directly by means of the Department of Communications and Public Works or by means of special agents.

Any infringement of this law is punishable by a fine of from $20 to $2,000 and imprisonment, according to the circumstances of the case.

The law also defines what is considered a crime or a fraud against property and prescribes the consequent penalties.

The railroads dependent on the Federation are subject exclusively to the Federal powers, the legislative, executive, and judicial branches having each their respective jurisdictions. Questions which may arise concerning the interpretation or fulfillment of concessions or of any of the stipulations contained therein, shall be decided by competent tribunals of the Republic and by the civil code of the Federal District.

TELEGRAPHS AND TELEPHONES.

The great difference in the relative cost of construction of telegraph and railway lines may undoubtedly be considered as the reason of the more extended development of the former means of communication. In 1877, Federal telegraph lines measured 7,927 kilometers; in 1892, 35,500 kilometers had been built, while in 1896, a network of lines 45,000 kilometers in length traversed the Republic under Government control. At the present time there is not a State capital nor any fairly important town which does not enjoy the benefit of telegraphic communication with the outside world.

In México, this branch of public service is divided into four classes: Federal telegraph lines, railroad telegraphs, lines belonging to private parties, and those which are State property. On June 1, 1891, the Federal service was organized into 20 districts (*zonas*), each under the immediate supervision of an inspector, the total number of offices being 280 and the extent of lines 29,305 kilometers. About the same time the Government purchased the Jalisco line, 2,514 kilometers in extent, making a total of 31,819 kilometers. On December 31, 1902, according to the latest available official data, México had 21 Federal telegraphic belts besides the Federal District, with 405 offices and a total length of line measuring 50,125 kilometers, the entire telegraph system at that time being as follows:

	Kilometers.
Federal lines	50,125.000
State lines	5,708.968
Private lines	3,942.725
Railroad lines	12,036.000
Total	71,812.693

These figures also embrace 13 Federal telephone lines, measuring 326.22 kilometers. There are 740 kilometers of Federal cable.

In his message to the Mexican Congress, President Diaz, under date April 1, 1903, makes the following statement in regard to telegraphic development:

"Telegraphic correspondence has continued to increase daily with very favorable pecuniary results. In the first half of the present fiscal year not only was the progressive increase in earnings maintained, but it exceeded expectations in a very gratifying manner. This increase in business has led to the adoption of certain special measures by the Executive, chief among which may be mentioned the laying of a federal submarine cable in the Gulf of México. Six new telegraph offices have been opened and 434 kilometers of new line strung, one of which was erected for the purpose of placing the important mining camp of Cananea in rapid communication with the rest of the country. The question of wireless telegraphy has also received serious attention. Two stations of the system that so far has produced

the best results in Europe were purchased, one being erected near Guaymas, Sonora, and the other at Santa Rosalía, Lower California. Sufficiently satisfactory experiments have been made with them. In order to facilitate telegraphic communication with foreign countries, the Mexican system has been connected with that of the United States at Eagle Pass, thus giving four telegraphic connections along the northern border of the Republic. In the interior the use of the long-distance telephone has been encouraged and developed, and for this purpose contracts have been made for the operation of this service in combination with private concerns."

In a similar document of later date, September 16, 1903, the same authority states: "With respect to the overhead telegraphs, 600 kilometers of new lines in various directions have been strung and four new offices have been opened.

"The experiments in wireless telegraphy between Guaymas and Santa Rosalía produced results which, though inferior to those obtained by ordinary systems, were sufficiently acceptable to induce the Government to utilize the new method of communication for a portion of its official service and even to throw it open to the public on trial.

"The telegrams dispatched during last fiscal year exceeded 3,000,000, and the cash returns from this source were 20 per cent more than those of the preceding period."

State lines.—The State telegraph lines in 1902 were as follows, according to Mexican official data:

	Number of offices.	Total length (kilometers).
Chihuahua	4	200.000
Durango	5	50.400
Guerrero	2	16.760
Hidalgo	38	1,003.000
México	8	293.800
Michoacán	20	1,190.080
Morelos	9	195.845
Oaxaca	7	266.000
San Luis Potosí	8	217.000
Sinaloa	3	134.080
Sonora	2	50.000
Tamaulipas	6	332.000
Territory of Lower California	2	153.000
Yucatán	5	140.000
Zacatecas	34	1,467.053
Total	153	5,708.968

Private lines.—The number of private lines for the same period was 22, with 28 offices, measuring in all 1,018 kilometers 393 meters, while the cable lines comprised 2,925 kilometers 832 meters, as follows:

Submarine cable:	Meters.	
Tampico to Galveston	791,783	
Tampico to Veracruz	395,891	
Veracruz to Coatzacoalcos	207,601	
Salina Cruz to La Libertad	698,442	
		2,093,717

Land line:	Meters.	
México to Veracruz	429,687	
Coatzacoalcos to Salina Cruz	402,328	
		832,015
Total		2,925,832

The railroad telegraph lines were divided as follows:

	Kilometers.
Ferrocarril Mexicano de Veracruz	517
Ferrocarril Nacional de México	1,441
Ferrocarril Central Mexicano	4,574
Ferrocarril Internacional Mexicano	1,441
Ferrocarril Mexicano del Sur	447
Ferrocarril Interoceánico	1,022
Ferrocarril México, Cuernavaca y Pacífico	293
Ferrocarril Mexicano del Norte	125
Ferrocarril Nacional de Tehuantepec	414
Ferrocarril de Veracruz á Alvarado	70
Ferrocarril de Sonora	431
Ferrocarril de la Compañía Constructora Nacional Mexicana	119
Ferrocarril de Vanegas, Cedral, Matehuala y Río Verde	66
Ferrocarril de San Marcos á Tecolutla	126
Ferrocarril de Chihuahua al Pacífico	200
Ferrocarril de Tlacotepec á Huajuapan	70
Ferrocarril de Toluca á Tenango	30
Ferrocarril de Esperanza al Xuchil	25
Ferrocarril de Guanajuato á Dolores Hidalgo y San Luis de la Paz	48
Ferrocarril de Coahuila á Zacatecas	126
Ferrocarril de Ixtlahuaca á Mañí	35
Ferrocarril de Río Grande, Sierra Madre y Pacífico	250
Ferrocarril del Cazadero á Solís	36
Ferrocarril de Sierra Pinta á la bahía de San Jorge	19
Ferrocarril de Tenango á Santa María	5
Ferrocarril de Naco á Cananea	64
Ferrocarril de San Bartolo y Río Verde	42
Total	12,036

Of late years the Federal Government has leased certain lines of its telegraph system to 20 different States, thereby saving the operating expenses of the lines without detriment to the public service.

The Republic is connected by telegraph with both Guatemala and the United States, and in December, 1897, the President of México approved and proclaimed a contract between his Government and the Western Union Telegraph Company and the Mexican Telegraph (cable) Company, both of which are American corporations, whereby communication by wire between México and foreign countries is to be carried on solely by means of the Federal telegraph system, in connection with those of the companies named. By the terms of the contract the Mexican Telegraph Company binds itself to pay to the Mexican Government 15 per cent of its annual profits, derived both from land and cable lines, it being further guaranteed by the company that said 15

PIXQUIAC BRIDGE, JALAPA AND TECALCO RAILWAY.

per cent shall not amount to less than $20,000 gold per annum during the term of the contract.

The number of telegraphic messages sent annually has steadily increased from 1,101,916 in 1891–92 to 1,865,303 in 1897, and to 2,866,146 in 1902, there being 1,976,406 private and 889,740 official telegrams sent over all lines during the year.

Telephones.—Telephone service throughout the country is excellent and daily improving. On December 31, 1902, according to the "Anuario Estadístico," for the same period, the total extent of the State and railroad telephonic system measured 40,657 kilometers 490 meters, divided as follows:

	Meters.
State lines	38,918,719
Railroad lines	1,738,771

MAIL SERVICE.

The Mexican Government has spared no effort to add, in every way possible, to the efficiency of the postal service of the Republic, and at times this has been a very onerous task. In 1885 the Government was confronted with a large disproportion between the receipts and expenditures in the service, being indebted in large amounts to publishers of periodicals,[a] mail contractors, and to nations with which México had accounts connected with the transport of mail matter. These debts have all been paid up and the service is to-day in a flourishing condition, and, though not a source of revenue to the treasury, is at least able to pay its own expenses.

Prior to 1877 there were throughout the entire Republic but 53 central and 269 branch post-offices; in 1887 the number had risen to 313 and 685, respectively; in 1894, to 483 and 974; in 1895, to 475 and 974. In 1897 the service was represented by 523 central stations, 1,091 branch offices, and 19 substations, and in the year 1902 by 2,207 post-offices, as follows: Central stations, 694; branch offices, 36, and 1,477 substations.

The compilation of regular postal statistics in the Republic dates from 1893–94, the basis of which was the postal movement of a month of 28 days multiplied by 13, the result not giving correct figures. Mexican figures show that the number of pieces of mail matter handled by the postal authorities of the country amounted in 1878–79 to 5,992,611; in 1888–89, to 27,429,081; in 1892, to 122,821,359, while in 1894–95 the number is given as 24,773,636 only. This apparent falling off is due to the fact that in the years preceding 1894–95 the entire postal movement, that is, mail matter received and sent out, was included in the estimate, while for the latter period only such matter as was sent out was reckoned.

[a] Under the Mexican regulations postmasters act as collectors of subscriptions and advertising bills, etc., due the publishers of newspapers.

From 1897 to 1902 the movement of mail matter of all kinds has been as follows:

	Pieces.
1897–98	112,840,890
1898–99	129,555,561
1899–1900	134,631,009
1900–1901	148,086,513
1901–2	156,518,498

President Díaz in his message to Congress April 1, 1903, makes the following statement in regard to the postal service:

"During the first half of the present fiscal year 5 local post-offices, 37 agencies, 1 branch office, and 4 ambulatory offices were created, giving a total of 2,254 offices. The circulation of postal matter of all kinds amounted to 77,000,000 pieces, against 74,000,000 pieces during the same period of the previous year. The interior postal drafts issued totaled $19,000,000, against $16,000,000 in the corresponding period of the previous year. The service of international drafts with the United States totaled $457,000 Mexican. Drafts collected and paid to publishers amounted to $213,000, against $211,000 during the corresponding period of the preceding year. The general earnings of the post-office were $1,320,000, against $1,156,000 during the corresponding period of the previous year."

The operations of the mail service during the fiscal year 1902–3, compared with the preceding fiscal year 1901–2, are reported by the Postmaster-General of México to have been as follows:

	1902–3.	1901–2.
Sale of postage stamps	$2,319,563.08	$2,053,593.29
Rent of postal boxes	69,703.00	60,504.00
Fines and forfeitures	33,912.18	26,169.31
Premiums on post-office money orders:		
Interior	200,912.55	219,390.31
International	3,378.47	3,687.01
Premiums on editors' drafts	90,995.12	90,716.39
Total	2,718,464.38	2,394,159.31

México was a party signatory to the Universal Postal Convention of Paris on June 1, 1878, and has since entered into conventions and parcel-post agreements with several nations, among others the United States, Germany, France, Great Britain, and Ireland.

STEAMSHIP LINES.

Prior to 1877 México may be said to have been isolated so far as activity in maritime commerce or communication was concerned, but since that time the Mexican Government has given great impetus to sea transportation by granting subsidies and special concessions to companies and individuals.

Up to 1896, 21 steamship lines had contracts with the Government for carrying the mails, of which 10 were Mexican, 4 American, 4 English, 1 Spanish, 1 French, and 1 German. Eight of these lines enjoy subsidies ranging from $75 to $2,000 for the round trip, or from $6,600 to $15,000 per annum. The other lines enjoy certain privileges and exemptions.

Latest official statistics (1902) report the following steamship lines as under contract with the Government to perform postal service:

The New York and Cuba Steamship Company (*American*).—This company has no subvention, but enjoys special exemptions. The steamers are required, under the terms of the contract, to make 52 regular trips to and from Progreso, New York, Veracruz, Tuxpam, Tampico, Frontera, Alvarado, Campeche, Coatzacoalcos, and Laguna.

The German Imperial Mail (*German*).—This line enjoys special exemptions and is required to make at least 2 monthly trips to and from Hamburg, Havre, Veracruz, Tampico, Progreso, and other ports.

Harrison Line (*English*).—This line enjoys special exemptions and is required to make at least 2 trips per month to and from Liverpool and Veracruz, with the privilege of stopping, on either trip, at Tampico, Tuxpam, Frontera, Campeche, and Progreso; also, at Barbados, St. Thomas, Trinidad, La Guaira, Puerto Cabello, Curaçao, Santa Marta, Sabanilla, Cartagena, Port au Prince, Kingston, Colón, and New Orleans.

Munson Line (*American*).—This line enjoys special exemptions and is required to make at least 2 round trips per month to and from New York, Philadelphia, or any other port of the United States on the Atlantic coast, and Tampico, Veracruz, and Progreso, with stops on either trip at other Mexican ports.

West India and Pacific Steamship Company (*English*).—This line enjoys special exemptions, making 2 trips per month with the same itinerary as the Harrison Line.

Atlantic and Gulf of México Steamship Company (*American*).—This line enjoys special exemptions, and is required to make at least 2 trips per month to and from either Mobile or Pensacola and Mexican Gulf ports.

Compañía de Navegación en los Rios Grijalva, Usumacinta and Palizada (*Mexican*).—This line has a subsidy of $9,000 per annum and is required to make 36 trips per year on the rivers named.

Compañía Mexicana de Navegación, S. A. (*Mexican*).—This line enjoys special exemptions and makes several trips per month between Veracruz, Coatzacoalcos, Frontera, Laguna, Campeche, Progreso, and to Tampico and intermediate points.

Compañía Industrial de Transportes (*Mexican*).—This line receives a subsidy of $6,000 per annum, and is under obligation to make 6 monthly trips on the rivers Gonzalez and Mezcalapa.

Pacific Mail Steamship Company (*American*).—This line enjoys special exemptions and is required to make 3 monthly trips. It connects all the ports of the Pacific coast of México with San Francisco on the north, with Central American ports on the south, and also connects with a New York service via Colón.

Compañía de Navegación del Pacífico (*Mexican*).—This line receives a subsidy of $3,500 per round trip, being required to make 18 trips yearly between Guaymas, La Paz, Altata, Mazatlán, San Blas, Manzanillo, Acapulco, Puerto Angel, Salina Cruz, Tonalá, San Benito, and other service.

Lower California Development Company (*Mexican*).—This line receives a subsidy of $150 per round trip during the continuance of the contract and is required to make 72 trips per year between San Diego, Todos Santos, and San Quintín.

Pacific Coast Steamship Company (*American*).—This line also enjoys special exemptions, the service required being at least 1 monthly trip between San Francisco, Cal., and Guaymas, touching at Ensenada de Todos Santos, Bahía de la Magdalena, San José del Cabo, Mazatlán, and La Paz.

Compañía Naviera del Pacífico (*Mexican*).—This company consists of three different lines, one required to make 48 trips per annum between Guaymas, La Paz, and Emeka and intermediate points, receiving for this service a subsidy of $18,000 per annum; another line receiving a yearly subsidy amounting to $5,857 for 4 round monthly trips between Mazatlán, Altata, and Topolobampo, and another line making 36 trips per year between Guaymas, Santa Rosalía, Mulegé, Loreto, and La Paz, receiving for this service $7,200 per annum.

Compañía Inglesa de Navegación por vapores en el Pacífico y Sud-Americana de Vapores (*English and Chilean*).—Receives a subsidy of $20,000 per annum, being required to touch at certain ports at least once or twice a month, as agreed.

Compañía de Navegación en los rios Grijalva, Chilapa y Tulija (*Mexican*).—This line is required to make 3 monthly trips between Frontera, Tepetitan, and Pavo Real, receiving for this service a subsidy of $2,880 per annum.

Mexican-American (*American*), from New Orleans to Veracruz, and Tampico. This line is required to make 24 trips a year, enjoying for the service special exemptions.

Kosmos Line (*German*).—This line enjoys special exemptions, the service required being 12 yearly trips from Hamburg and other European and South and Central American ports.

Compañía Limitada de los Ferrocarriles de Veracruz (*Mexican*).—Has a subsidy of $6,732 per annum, the service required being 312 trips a year between Alvarado and Chocaltianguis, 104 between Alva-

rado and San Juan Evangelista, and 156 between Alvarado and Alonso Lazarro, touching at intermediate ports.

There are, besides, other important lines which ply in Mexican waters, but enjoy no privileges whatever. Among these lines are the Morgan Line (American), the Royal Mail Steam Packet Company (English), the Hamburg-American Packet Company (German), and Spanish and French lines.

A great number of concessions have been granted by the Government to companies purposing to establish new steamship lines on both coasts, all of which promise to add greatly to the efficiency of the service between the ports on their respective itineraries.

CHAPTER XV.

PUBLIC LANDS—COLONIZATION AND IMMIGRATION LAWS.

México may be divided into three regions, which the "Mexican Financial Review" calls, respectively, the *hacienda* country, the *pueblo* country, and the free country.

The first-named or farming country comprises the greater part of the central plateau, many of the temperate valleys situated on the slopes or terraces of this plateau, nearly all of the Gulf coast, and many points on the Pacific.

The *pueblo* or community holdings lie toward the southern part of the country.

The free country or public lands, so called because of the fact that few if any *haciendas* or *pueblos* exist there, is situated in the north of the Republic.

As regards the central plateau, it is really marvelous that its lands retain their fertility, considering their great productiveness for hundreds of years. The only way this can be accounted for is that the system of irrigation there in vogue yearly resupplies the soil with natural fertilizing matter.

Previous to the conquest this very land had to provide food for at least twice the existing population of the country, and was producing for more than six centuries unceasingly and without fertilizers. Strange, indeed, then, that it has not become sterile. But it is said that the day is fast approaching when the fecundity of this soil will vanish. Dryness and barrenness are already becoming evident in certain portions of the table-lands; but irrigation companies are being organized steadily, and will undoubtedly prevent this undesirable tendency.

The almost virgin land, and that which invites the energetic arm of the careful husbandman, lies on the east and on the west, toward the coasts, and when railroads shall have united one and the other points many fertile valleys will be in a position to yield two and three crops a year.

The free or public lands are situated mostly in parts of the States of Chihuahua, Coahuila, Durango, Sinaloa, and Sonora. Immense tracts are here almost uninhabited, and in the western Sierra Madre

the plains reach down to the Tropics. These lands were formerly settled upon by religious orders, or were held by officers of the Spanish Crown. After the war of independence and the escheating to the State of ecclesiastical holdings they became public lands, and are what are now called *terrenos baldíos*. The nation, under laws to that effect enacted on July 20, 1863, and March 26, 1894, is having these lands surveyed and measured, giving to the companies doing the surveying one-third of the land surveyed, and disposing of the rest, some gratuitously to towns as commons, and to private parties and companies at fixed rates. Some 28,211,607 acres have thus been disposed of since 1867 up to December 31, 1895, and the Government still retains in the neighborhood of 25,000,000 acres. For the lands sold the public treasury has received $2,508,849.04 up to the date mentioned. From July 1 to December 31, 1897, there were public lands sold in eight States, under the two laws referred to, to the extent of 90,858.67 acres, producing $30,755.13.

The following table from Mexican official statistics shows extent, value, and number of titles of public lands issued by the Government from 1898 to 1902:

	Number of titles issued.	Area.		Value.
		Hectares.	Ares.	
Grants of public lands	668	579,628	26	$365,880.20
Sale of national lands	556	1,231,595	32	1,308,508.90
Titles issued to colonists	283	5,526	80	19,120.09
Titles issued under certain agreements	56	408,753	39	141,943.66
As compensation for surveying expenses	40	173,611	66	.....
Gratuitous grants to townships, etc	4,350	48,827	55	.....
Grants covering *excedencias*, *demasías*, etc	69	497,825	35	.....
Gratuitous grants, as provided in act Nov. 27, 1896	253	47,041	81	.....
Subsidies granted to railway companies	1	71,591	50	.....
Total	6,276	3,064,401	69	1,835,452.85

The following statement shows the extent of Government lands sold and the price from January 1 to June 30, 1903:

State.	Land sold.	Price.
	Hectares.	
Coahuila	1,912	$637.64
Chiapas	450	150.27
Chihuahua	2,804	224.34
Durango	15,357	11,262.08
Sinaloa	77	51.77
Tabasco	2,855	3,428.06
Tamaulipas	2,691	2,048.03
Yucatán	2,725	2,306.11
Zacatecas	35	52.04
Total	28,934	20,160.34

LAND LAW.

The general land law of México was originally promulgated on March 26, 1894, the regulations governing its application bearing date of June 5 and October 1 of the same year.

Under this law Government lands are divided into four classes, as follows:

1. *Terrenos baldíos* (public lands) are all lands in the Republic not devoted to public use by the proper authorities, nor by them conveyed, gratuitously or otherwise, to private individuals or corporations, according to law.

2. *Demasías* (excess holdings) are the lands in possession of private individuals in excess of the area determined by the boundaries established by the original grant, when such holdings lie within said boundaries, being a part of the whole grant.

3. *Excedencias* (outside possessions) are lands possessed by private individuals for twenty or more years, lying beyond the boundaries established by the original grant, but adjoining the land under such grant.

4. *Terrenos nacionales* (national lands) are the unallotted public or vacant lands surveyed by official commissions or by duly authorized corporations, or public lands denounced by private individuals who have subsequently abandoned their claims, or when such claims have not been granted, provided the land has been actually surveyed.

In general terms the law provides that all residents in the Republic of legal age and contractural capacity have the right to denounce or preempt public land in any part thereof to an unlimited extent, except natives or naturalized citizens of bordering nations, who can not through any title acquire land in any State or Territory bordering on their country. The privilege hereby granted in nowise repeals the limitations of laws now or hereafter to be enacted relating to the acquisition of real estate by aliens.

The Executive shall establish, by decree to be published in January of each year, the schedule of prices of public lands in each State, the Federal District, and the Territories. This schedule shall remain in force during the fiscal year next succeeding its publication.

The following lands can not be alienated through any title whatsoever:

1. The seashore.

2. The shore lines extending 20 meters back of high-water mark along the coasts of the mainland and islands.

3. A strip 10 meters wide along each bank of navigable rivers and 5 meters wide along the banks of smaller streams capable of floating any marketable substance.

4. Lands having monumental ruins, together with the ground that may be declared necessary for their care and preservation.

The Department of Promotion (Fomento) is authorized to enter into contracts for the exploitation of public lands or to lease said lands while no claims or denouncements are pending, and to issue proper rules and regulations for the cutting of timber or the development of such land products, establishing penalties for the violation of said rules and regulations.

Lessees or contractors for public lands may be granted the right to acquire said lands at a certain rate, in case third parties should file claims for grants covering the lands in question. This right is to be enforced within thirty days after the denouncement or claim is filed, the lessees or contractors being under obligation, should they acquire the land, to reimburse the claimant for all surveying and other expenses connected with the filing of the denouncement.

Licenses granted for the exploitation of public lands expire upon the final grant of the land to a denouncer or claimant.

The denouncing of public lands must be made before the agent of the Department of Promotion within whose jurisdiction the land is situated.

Within fifteen days after the filing of the necessary petition, the agent must investigate whether the land has been surveyed or is reserved for forests, colonies, or settlement of Indians, or otherwise.

Every denouncement must be published in the office of the agent, the official paper of the State, District, or Territory where the land is situated, at the expense of the denouncer, at whose expense also the survey of the land is to be made by an expert engineer to be named by him with the approval of the agent.

The survey and the plat of the land having been made and no protest having been filed, the agent will make copies of the record and plat and transmit the same to the Department of Promotion, through the governor of the State in question, for inspection.

Should the Department find the record, plat, etc., unobjectionable, it will adjudicate the land in favor of the denouncer and notify him to pay the price thereof.

This price is that fixed by the schedule in force at the time the denouncement is made, and must be paid within two months after notification. If this term should expire without proof of the payment having been received at the Department, the denouncer loses the rights he may have acquired; otherwise the patent will be delivered to him.

Should any protest be interposed, the matter will be carried to the court of the district within whose jurisdiction the land is situated, to try the issues. In such suits the district attorney will represent the Government. Suits of this character act as a stay of all administrative action until final judgment is delivered.

Under the law, as given in substance above, the Secretary of Promotion publishes every year the prices at which Government lands

may be purchased. In pursuance thereof the prices for such lands for the year 1904–5 have been published. The following table gives the price per hectare (2.471 acres):

State or Territory.	Price.	State or Territory.	Price.
Aguascalientes	$2.20	Puebla	$3.30
Campeche	2.25	Querétaro	2.20
Chiapas	3.00	San Luis Potosí	2.50
Chihuahua	1.20	Sinaloa	1.20
Coahuila	1.10	Sonora	1.30
Colima	1.10	Tabasco	3.60
Durango	1.20	Tamaulipas	1.20
Guanajuato	2.20	Tlaxcala	2.20
Guerrero	1.20	Veracruz	2.75
Hidalgo	2.50	Yucatán	2.20
Jalisco	2.20	Zacatecas	2.20
México	2.75	Federal District	6.10
Michoacán	4.40	Territory of Tepic	2.50
Morelos	3.00	Territory of Lower California	.70
Nuevo Leon	1.10	Territory of Quintana Roo	.50
Oaxaca	1.20		

The price is not payable in cash but in bonds of the national debt, the value of which varies from time to time, the tendency for the past three years being decidedly upward.

COLONIZATION.

México has made sacrifices to induce people to its shores, but its efforts in this behalf have not caused any considerable influx of foreigners to the country. Mexicans attribute this state of things to two causes, viz, the fact that free land is situated at a considerable distance from means of communication, and that the country is not so devoid of native population as is generally supposed. The Indian lives on very little and can therefore afford to work for such paltry wages that foreign immigrants can not compete with him. When the general state of the country shall be such as to create a voluntary current of immigration, it is confidently believed that the Republic will reap the reward of its sacrifices, for it is a country where the immigrant, under the colonization laws, has the smallest amount of taxes to pay.

The first steps taken in the direction of inducing aliens to seek México's fertile fields date back to 1827. In the year 1821 a law was enacted entitled "Prosperidad General" (general prosperity), in which special reference is made to the rapid growth of the foreign colony in the State of Texas. In the year 1846 the then Minister of Foreign Affairs, José M. Lafragua, presented a plan for legislation to Congress in which, *inter alia*, he spoke of "the neglect of colonization as a crime of high treason," and held out the flattering but delusive hope of establishing innumerable colonies to contain at least 50,000 persons. During the imperial period Señor Robles submitted to Congress plans of the same sort, as did also Señor Balcárcel in 1868, and Señor Riva Palacio in 1877; but up to 1882 no really serious practical efforts were made to attract immigration, and the results obtained up to the present are comparatively insignificant.

COLONIZATION LAW.

The colonization law now in force was enacted and promulgated on the 15th day of December, 1883. It comprises four chapters and thirty-one articles, the former being entitled, respectively, "Of the survey of lands;" "Of colonists;" "Of companies;" "General provisions."

The provisions of this law are, in substance, as follows:

For the purpose of securing lands suitable to the establishment of colonies, the Executive will cause the waste or Government lands in the Republic to be surveyed, measured, subdivided, and appraised, appointing to this end the corps of engineers he may deem necessary, and determining the methods to be followed.

No subdivision shall in any case exceed 2,500 hectares (about 6,177 acres) in extent, this being the greatest amount of land which shall be conveyed to any one individual of lawful age and legal capacity.

The lands surveyed, measured, subdivided, and appraised may be conveyed to foreign immigrants and inhabitants of the Republic who may desire to establish themselves thereon as colonists, under the following conditions:

(1) By purchase, at the price set by the engineers and approved by the Department of Promotion, payable in ten years in equal installments, the first becoming due two years after the establishment of the colony.

(2) By purchase, the price being paid on entry, or in installments on shorter time than that provided in the preceding section.

(3) By gratuitous concession, when requested by the colonist; but in this case no cession shall exceed 100 hectares (about 247 acres), and the colonist shall receive no title to the same until he shall have shown that he has retained the land in his possession, and has wholly cultivated it, or to an extent not less than one-tenth of the whole for five consecutive years.

So soon as there shall be lands suitable for colonization under the conditions herein provided, the Executive shall determine which should be settled at once, publishing the plats thereof and the prices at which they shall be sold, endeavoring in every case that the sale or gratuitous conveyance shall be of alternate sections. The remaining sections shall be reserved to be sold under the conditions prescribed by the law when they shall be sought, or when the Executive shall so determine, the Executive being empowered to mortgage them for the purpose of raising funds which, added to the proceeds of the sale of sections of land, shall be exclusively destined to the carrying out of colonization.

To be considered as a colonist and to be entitled to the privileges conferred by this law it is necessary that the colonist, in case he is a foreigner, shall come to the Republic provided with the certificate of

the consular or immigration agent, issued at the request of the said immigrant, or of the company or corporation authorized by the Executive to bring colonists to the Republic

Should the petitioner reside in the Republic, he must apply to the Department of Promotion, or to the agents authorized by the said Department to admit colonists to the colonies, which shall be established in the Republic.

In every case petitioners must present certificates of the proper authorities setting forth their good character and their occupation previous to petitioning for admission as colonists.

Colonists settling in the Republic shall enjoy for the period of ten years, counting from the date of their establishment, the following privileges:

(1) Exemption from military service.

(2) Exemption from all taxes except municipal.

(3) Exemption from all import or domestic duties on articles of consumption not produced in the country, agricultural implements, tools, machines, outfits, building materials, household furniture, and animals for breeding purposes, and thoroughbreds for the use of the colonies.

(4) Exemption, personal and nontransferable, from export duties on the products of cultivation.

(5) Premiums on praiseworthy productions, and prizes and special protection for the introduction of new agricultural interests or industries.

(6) Exemption from fees for the certification of signatures and issuing of passports delivered by consular agents to parties coming to the Republic as colonists by virtue of contracts entered into between the Government and any company or companies.

The Department of Promotion shall determine the number and kind of articles which in each case shall be admitted free of duties, and the Finance Department shall regulate the manner of admission to prevent fraud and smuggling, but without retarding the prompt dispatch of the said articles.

Colonists settling on lands barren of trees, and who shall prove, two years previous to the lapse of the period of exemption, that on a portion of their section, which shall not be less than one-tenth thereof, they have laid out trees to a number proportionate to the land planted on, shall be exempt from taxes on the whole land for one year longer, and, in general, shall have exemption for one year further for each tenth part of their land so laid out.

The colonies shall be established under the municipal jurisdiction, subject, as regards the election of their authorities and the levying of taxes, to the general laws of the Republic and the laws of the State wherein they are established. The Department of Promotion may,

CATHEDRAL OF GUADALAJARA, STATE OF JALISCO.

however, appoint agents in said colonies for the purpose of better directing their labors and exacting the payment of the amounts which may be due to the Federation for any titles conveyed.

Colonists are required to carry out their contracts with the Federal Government, or with the individuals or companies transporting or establishing them in the Republic.

Every alien immigrant settling in a colony shall, at the time of such settlement, declare before the Federal colonization agent, notary, or proper judicial officer, whether he proposes to retain his nationality, or desires to embrace Mexican citizenship, conceded him by the third section of article 30 of the Constitution of the Republic.

Colonists shall be vested with all the rights and obligations which to Mexican and foreigners, under like circumstances, are conceded and imposed by the Federal Constitution, besides the temporary exemptions conceded by this law; but all questions arising, of whatever character, shall be subject to the decisions of the courts of the Republic, to the absolute exclusion of all foreign intervention.

Colonists abandoning, without due cause, for more than a year, the lands which shall have been sold them shall forfeit the right to said lands and the amounts they may have paid therefor.

The right to a gratuitous title shall be forfeited by abandonment of the land or failure to cultivate it for more than six months without good cause.

One section shall be ceded without cost, in localities designed by the Federal Government for new settlements, to Mexican or foreign colonists desiring to found the same; but they shall not acquire the title to said section until they shall show that within two years from the foundation of the settlement they have erected thereon a house, forfeiting the right to said title in case of failure to so build. It is the purpose to cede such sections alternately.

The Executive is empowered to aid colonists or immigrants, within the appropriations to that effect made, whenever he shall deem it advisable, by furnishing them expenses of transportation for themselves and their baggage by sea and in the interior to the terminus of the railroad lines; he may further furnish them with free subsistence for fifteen days, and no more, in the localities he may approve, and also with tools, seeds, building materials, and animals for work and breeding; these latter advances, however, shall be repaid in the same manner as the price of the lands.

The Executive may authorize companies to open up (*habilitar*) waste lands by measuring, surveying, subdividing into sections, appraising and describing the same, and to transport colonists and establish them on said lands.

For the purpose of obtaining the necessary authorization, companies shall designate the waste lands they propose to occupy, their approxi-

mate extent, and the number of colonists to be settled upon them within a given time.

The proceedings incident to the demarcation or survey shall be authorized by the district judge within whose jurisdiction the waste land to be surveyed is situated, which done, and there being no adverse claimant, the record will be delivered to the company to be presented to the Department of Promotion, where the other formalities demanded by this law must be complied with. Should an adverse claimant present himself the case will be tried as hereinafter provided, the representative of the Federal Treasury being a party thereto.

In return for the expenses incurred by the companies in opening up waste lands, the Executive may cede them not more than one-third of the land thus opened up, or its value in money, but under the express conditions that they are not to convey such lands so conceded to foreigners not authorized to acquire them, nor in greater quantities than 2,500 hectares, under pain of losing, in each case, the portions of land so conveyed in violation of said conditions, which portions shall at once become the property of the nation.

Lands surveyed by the companies, excepting such as may be ceded to the same in return for expenses incurred in opening them up, shall be conveyed to colonists, or be reserved under the conditions before mentioned.

Any authority conferred by the Executive for opening up waste lands shall be void and nonextendible whenever work thereon shall not have been commenced within the term of three months.

The Executive may contract with companies or corporations for the introduction into the Republic and the establishment therein of foreign colonists or immigrants under the following conditions:

(1) The companies shall fix the exact time within which they will introduce a determined number of colonists.

(2) The colonists or immigrants shall fulfill the conditions hereinbefore prescribed.

(3) The bases of the contracts the companies may make with the colonies shall conform to the provisions of this law, and shall be submitted for approval to the Department of Promotion.

(4) The companies must guarantee to the satisfaction of the Executive the carrying out of the obligations assumed in their contracts, which contracts must name the causes in which forfeiture and fines shall be imposed.

Companies contracting with the Executive for the transportation to the Republic and settling therein of foreign colonists shall enjoy, for a term not to exceed twenty years, the privileges and exemptions following:

(1) The sale on long time and at low price of waste or Government lands for the exclusive purpose of colonizing the same.

(2) Exemption from taxation, except the stamp tax on capital invested in the enterprise.

(3) Exemption from port dues, except such as are set aside for harbor improvements, to all vessels that, on the company's account, shall carry ten families, at least, of colonists to the Republic.

(4) Exemption from import duties on tools, machines, building materials, and animals for work and breeding which shall be exclusively destined for an agricultural, mining, or industrial colony whose establishment shall have been authorized by the Executive.

(5) Premiums for each family established, and a second premium for each family disembarked; premiums for each Mexican family established in a foreign colony.

(6) Transportation of colonists at the expense of the Government on subsidized steamship and railroad lines.

Foreign colonization companies shall be considered as Mexican, being required to have a legal domicile in one of the cities of the Republic, without prejudice to their having one or more abroad, and they are bound to have at all times a local board of directors, and one or more attorneys de facto, fully empowered to treat with the Executive.

All questions arising between the Government and the companies shall be decided by the courts of the Republic and according to its laws, without any intervention whatever on the part of foreign diplomatic agents.

Private parties setting aside any portion of their lands for the purpose of colonizing them with not less than ten families of foreign immigrants are entitled to have the same, enjoy equal privileges and exemptions with the colonies established by the Federal Government whenever they shall conform to the conditions imposed by the Executive to assure the success of the colony, and whenever among said conditions shall be one requiring said colonists to acquire, by purchase or cession, one section of land for cultivation.

The Executive may provide private parties with foreign colonists by stipulating with them the conditions under which they are to be established, and may aid them by furnishing the expenses of transportation of said colonists.

The colonizing of the islands in both oceans shall be done by the Executive, subject to the provisions of this law, the Government reserving on each island 50 hectares of land for public use. In case the island should not have the superficial area necessary for the reservation herein specified, no sale of land shall be made thereon, and said land may only be rented on short terms.

Colonies established on islands shall always include Mexican families to a number not less than one-half of the total colonist families.

The Executive is authorized to acquire, by purchase or cession,

private lands, whenever he shall deem it expedient to establish colonies thereon, subject, however, to the appropriations to be made for this purpose.

Local legislation.—The question of inducing aliens to settle in México has awakened not only the interest of the General Government, but some of the State governments have given it much time and thought. Foremost among these is the government of the State of Veracruz. On the 25th of December, 1885, the legislature of this State passed a law founded upon that quoted on the preceding pages. This law authorized the governor to enter into contracts with owners of suburban landed property for the purpose of colonizing it under the law. All such owners entering into a contract are entitled to a rebate on their taxes at the rate of $5 for every family settling on their lands who shall engage in agricultural and kindred pursuits. Owners of suburban lands receive a premium of $5 for every 15 foreign families established on their lands as colonists for an uninterrupted period of three years. Premiums are likewise offered for every new industry established in such colonies, and to the colonist showing the largest area of land under cultivation. Many exemptions from taxes and contributions are granted. Every colony of 15 or more families definitely established in any locality in the State is entitled to organize its own local police in accordance with law, and to solicit of the Government a subvention to carry out such public works as may be deemed necessary in the interest of the colony.

Colonies.—Under the general law of the General Government 34 colonies had been founded up to October 19, 1897. The colonies, their names, location, etc., as furnished by the Bureau of Statistics of the Mexican Republic under the above date, here follow:

Colonies founded by the Federal Government.

Name of colony.	Location.		Number of colonists.		
	District, etc.	State.	Mexicans.	Foreigners.	Total.
Porfirio Díaz	Juarez	Morelos	294	11	305
Fernandez Leal	Cholula	Puebla	8	437	445
Cárlos Pacheco	Tlatlauquitepec	....do	21	81	102
Manuel Gonzalez	Huatusco	Veracruz	46	378	424
Diez Gutierrez	Ciudad del Maiz	San Luis Potosí	283	63	346
Aldana	Municipality of México	Federal District	21	89	110
Sericicultora	Tenancingo	México	112	.....	112
Tecate	Distrito Norte	Lower California	210	.....	210
La Ascensión	Bravos	Chihuahua	1,218	.....	1,218
San Pablo Hidalgo	Juarez	Morelos	208	.....	208
San Vicente Juarez	....do	....do	128	.....	128
San Rafael Zaragoza	....do	....do	278	.....	278
Jiscao	Comitán	Chiapas	40	.....	40
Total			2,867	1,069	3,926

In 1900, the latest available statistics on the subject show that the colonies of Manuel Gonzalez, in Veracruz; Fernandez Leal, in Puebla, and La Ascensión, in Chihuahua, had been created townships (*pueblos*),

passing under control of the respective States, while Sericicultora, in México, devoted to the cultivation of the silk worm, had been abandoned by the colonists. The total number of colonists in the remaining 9 colonies founded by the Government is officially given in 1900 at 2,818, there being 1,991 Mexicans and 196 foreigners, the largest colonies being Jiscao, with 442 colonists; Diez Gutierrez, with 329; Porfirio Díaz, with 280; San Rafael Zaragoza, with 278, and San Pablo Hidalgo, with 208.

The colonies founded by authorized companies were 20 in 1900, as follows:

Founded by authorized persons.

Colony.	Location.		Number of colonists.		Total.
	District, etc.	State.	Mexican.	Foreigners.	
Japonesa de Exculntla	Soconusco	Chiapas		58	58
Yalikin	Eastern Coast	Yucatán		120	120
Vega San José					
Puerto Morelos					
Oaxaca	Moctezuma	Sonora		344	344
Metlaltoyuca	Huauchinango	Puebla		39	39
Juarez	Bravos	Chihuahua		678	678
Diaz			37	603	640
Pacheco				206	206
Dublán			59	711	770
García	Guerrero	....do		112	112
Chuichupa	....do	....do		98	98
Carlos Pacheco	Ensenada Todos Santos.	Lower California	54	326	380
Romero Rubio	San Quintín	....do	4	69	70
Novalato	Culiacán	Sinaloa		12	12
Tlahualilio	Mapimí	Durango		18	18
Ranchos Agrícolas	Monclova	Coahuila		100	100
Progreso	Distrito Norte	Tamaulipas	6		6
Cafetera de Simojovel	Simojoval	Chiapas	32		32
Cafetera de Soconusco	Soconusco	....do	6	31	37
Total			198	3,525	3,723

The number of titles issued by the Government to colonists in the Federal colonies, from January 1, 1897, to December 31, 1901, was, according to official figures, 403, covering an area of 5,421 hectares, amounting to $21,173.

New concessions.—The latest important concession made by the Government for the purpose of colonization was granted to the Blalock Colony Company, by which this organization is authorized, to establish on the land it owns, under the name of "El Chamal," in the municipality of Santa Bárbara, State of Tamaulipas, an agricultural and industrial colony. According to the terms of the concession the company binds itself to settle upon the Chamal estate within two years from the date of the promulgation of the concession, at least 100 families of colonists, whose members in the aggregate shall not be less than 250 persons. These colonists shall settle upon alternate lots, leaving a lot of 10 hectares between settlers, so that the Mexican Government may on its own account establish in the intervening lots colonists of Mexican nationality, who will be entitled to acquire land at the same price

charged to the company's colonists, the only condition being that the persons thus settled shall be peaceable and law-abiding people. For purposes of colonization a "family" will be understood to be:

"A husband and wife, with or without children.

"A father or mother, with one or more descendents, subject to parental authority.

"Brothers and sisters, one being of age and the other or others minors."

The company binds itself to sell or give to each family one or more of the plots for cultivation, as well as a site for a residence, the plot to be of a minimum area of 10 hectares, and the residence site will have a minimum area of 2,000 meters. The company binds itself to deliver to the head of each family a provisional title deed to the plot of land for cultivation and the house site assigned to him, said head of a family being obliged to cultivate the former for five years in order to obtain the title deed in fee simple. In the event of the colonist preferring to pay to the company the price of the land, the company may at once execute the deed of sale without the limitation above referred to. For each of the families required to be established by the concession, and which the company fails to so establish, the company will pay a fine of 100 pesos in bonds of the public debt.

In accordance with the provisions of article 7 of the law of colonization in force, the colonists settled by the concessionaire company will enjoy for ten years, counted from the date of the settlement of each family, the following franchises:

Exemption from military service; exemption from all kinds of taxes, with the exception of municipal taxes and the stamp tax; personal and untransferable exemption from import duties on agricultural implements, tools and fixtures, machinery, building materials for houses, furniture in use, animals for draft and breeding purposes, all destined for the colony, the importation of the animals being subject to the provisions contained in the circulars of the Department of Promotion, June 9, 1893; personal and untransferable exemption from export duties on products raised by the colonists, and exemption from the fees on the legalization of signatures, and the issuance of passports made out by consular agents to individuals coming to México to join the colony. The duration of the concession will be ten years from the date of its promulgation.

Another important contract has been made by the "East Coast of Yucatán Colonization Company," for the establishment in the Territory of Quintana Roo, from 50 to 150 families.

For the purposes of the contract, a "family" will be considered to be a household in which there is at least one able-bodied male worker. The company will grant to the colonists free passage to the lands, an advance of from $10 to $20 gold, a dwelling, agricultural implements,

a team of oxen, and other domestic animals and fowls, as specified. The colonists will also be furnished with articles of general consumption at equitable prices, and firewood may be cut from the forests, reservation, however, being made in the case of cabinet woods. Free medicine will also be supplied in case of illness on the part of the colonists. The colonists will engage in tropical agriculture, but, in addition to cultivating and improving their own tracts, they may also work for the company for wages that can not be less than $1 (Mexican) per day.

Contracts have been made during the first half of the fiscal year 1903–4, for colonization in land in the State of Chihuahua, and the settlement of Boer families. Efforts are being made to settle Porto Rican families in Tabasco and on the Gulf coast, according to President Diaz's message to Congress, April 1, 1904.

CHAPTER XVI.

EDUCATION—RELIGION—PROTESTANT MISSIONS.

Education in México has been for many years the subject of serious consideration on the part of the Government, on account of the difficulty experienced in combating the conservative ideas prevailing in the Republic. The main obstacles have, however, been overcome, and the country to-day enjoys the benefit of a liberal system of education, which is administered under three branches—gratuitous, lay, and obligatory. Laws have been enacted, normal schools for both sexes have been established, and in order to still further extend the benefits to be derived from a uniform educational system throughout the whole country, the Government convoked the various States for a National Congress of Education. The labors of this congress resulted in the grading of educational facilities from primary or children's schools to higher grades and special institutions of learning; the preparation of general plans of study for all grades; the division of the subjects taught into annual courses; also provided for the unrestricted selection of the latest and most improved methods of instruction suitable to each grade; and, in short, for the examination and choice of whatever systems, either technical or administrative, which might be deemed suitable to the ends for which the congress was convened.

The Executive at that time laid before Congress the plan of a reform of the law of March 21, 1891, placing elemental tuition under the care of municipalities and obliging them to establish at least one school for each 4,000 inhabitants. This law obtained the approval of Congress, and by virtue thereof the municipal schools of the Federal district and of the Territories came under Federal jurisdiction. The superior board of primary education (Dirección Superior de Instrucción Primaria) was also created for the reorganization, superintendence, and management of said institutions.

Legislation.—The law making education compulsory was promulgated March 23, 1888, but its enforcement was not decreed at that time, and the first Congress of Public Education was convened for the purpose of adopting such measures as should tend to establish an efficient and uniform system of education. This congress met on December 1, 1889, and closed its sessions on March 31, 1890, after having passed on and approved 124 questions, the principal being the establishment of a national system of popular education based on the uniformity of obligatory, gratuitous, and laical primary education, children from 6 to 12

years of age to be given an elementary primary education embracing four courses or scholastic years. The general programme for elemental primary obligatory education embraces practical morals, civic or laical instruction, the national language (including writing and reading), object lessons, arithmetic, the principles of physical and natural sciences, geography, history of the country, practical notions of geometry, drawing, singing, gymnastics, and for girls, sewing, etc. Resolutions were passed relating to rural schools, itinerant teachers, kindergartens, etc., and it was declared indispensable that education for adults should be provided for in cases where persons had been unable to receive instruction during childhood. Education was also declared compulsory in soldiers' barracks, jails, penitentiaries, and institutions of correction. Superior primary education was declared compulsory for students desiring to enter preparatory and professional schools which did not exact a secondary education, the period required for this branch being two years. Several other measures of similar import were also passed.

A second congress was convened on December 1, 1890, which solved certain problems on compulsory elemental educatiou, fixed the methods to be followed in the schools of superior primary education, and settled matters pertaining to normal schools, preparatory education, and special schools. As a result of this congress, the law of March 21, 1891, was enacted, regulating compulsory education in the Federal district and the Territories of Tepic and lower California, which law became effective on January 17, 1892.

The primary schools previously supported by the Government were those which were under the care of the Compañía Lancasteriana, which, since 1822, had been working earnestly and unceasingly for gratuitous public education. The methods employed, though formerly excellent, had become obsolete, and by the act of March 29, 1890, the Government resolved to bring these schools directly under the protection and jurisdiction of the nation. They were consequently placed under the supervision of the Department of Justice and Public Education, the Treasury being ordered to take charge of all buildings and moneys used in the maintenance of the institutions, as they were in reality the property of the Republic.

Law of public instruction.—On May 19, 1896, the law of public education was promulgated, its salient points being as follows:

Official primary elemental education in the Federal district and Federal Territories was placed under the exclusive control of the Executive; primary superior education was organized as an intermediate educational system between elementary and preparatory instruction. A general board of primary education was created, charged to develop and maintain the same under a scientific and administrative plan. Preparatory education was decreed to be uniform for all pro-

fessions, its extent being limited to the study of such matters as are necessary to the development of the physical and intellectual faculties and the morals of youth, it being further directed that professional education be reorganized, limiting it to technical matters which pertain to the profession or professions to which each particular school is devoted.

By virtue of this law public education ceased to be in charge of the board of aldermen (ayuntamientos) of the above-mentioned sections. At the time of its promulgation the municipality of México contained 113 schools supported by the board of aldermen, 14,246 students being entered on the rolls with an average attendance of 9,798.

Each State defrays the expenses of public education, either with funds specially appropriated for that purpose or with the municipal funds.

Institutions.—In 1876 there were throughout the country 8,165 primary schools, with 368,754 students of both sexes. In 1895 Government schools reached the number of 4,056, of which 2,189 were for males, 1,119 for females, and 748 for both sexes; municipal schools numbered 3,394—for males, 1,754; females, 932; both sexes, 708. These comprised 7,380 primary, 32 secondary, and 35 professional schools, the number of students enrolled being 310,496 males and 181,484 females (a total of 491,980), and the mean attendance 338,066. The total cost to the Government and the municipalities for the maintenance of these institutions was $3,973,738. In the same year private schools to the number of 1,816 were being conducted, 659 for males, 460 for females, and the remainder under a coeducational system. In addition, 276 were supported by the clergy and 146 by associations, the total number of students enrolled being 68,879, of which 40,135 were males and 28,744 females. The total number of private schools was accordingly 2,238, of which 2,193 were devoted to primary education, 34 to secondary instruction, and 11 to professions.

The total number of schools in 1900 and 1901 and the average attendance are shown in the following table:

Schools.	1900.		1901.	
	Total.	Average attendance.	Total.	Average attendance.
Federal and municipal institutions.				
Primary	9,363	479,785	9,491	477,586
Secondary and preparatory	41	5,405	42	5,484
Professional	60	5,837	62	6,624
Private institutions.				
Supported by the clergy	498	117,543	477	124,257
Supported by associations	152		173	
Private schools	2,068		1,995	
Grand total	12,177	608,070	12,240	613,961

Official figures for 1902 show the following data:

Shools.	Male.	Female.	Mixed.	Total.	Average attendance.
Federal, State, and municipal institutions.					
Primary	4,856	2,499	1,924	9,279	498,616
Secondary and preparatory	30	11	5	46	5,808
Professional	30	11	12	53	4,672
Private institutions.					
Supported by the clergy	346	256	103	702	122,161
Supported by associations	56	64	56	176	
Private schools	618	413	278	1,579	
Total	5,936	3,254	2,378	11,835	631,257

The State of México is not represented in the "Anuario Estadístico" for 1902, used in the compilation of the above table, but for statistical purposes the figures corresponding to the year 1901 have been added.

The number of students enrolled in the Federal, State, and municipal schools was, for the primary schools, 415,197 males and 244,162 females, or a total of 659,359; secondary and preparatory schools, 5,044 males, 2,303 females, total, 7,347; and in the professional institutions, 6,640 males and 2,434 females, giving a total of 9,074, making a grand total of 675,780 scholars for the Government schools. Those enrolled in the private institutions were 83,830 males and 66,117 females, or a total of 149,947, thus showing that the total number of scholars enrolled in all the educational institutions of the country in 1902 amounted to 825,727.

The expenses connected with the branch of the Government service during the same year amounted to $6,595,000, in round numbers, there being 15,229 employees, including superintendents, principals, and teachers of both sexes.

In addition to the normal and primary schools, the Government also supports many other institutions, among which the principal are the following: School of jurisprudence, school of medicine, school of agriculture and veterinary instruction, school of engineers, school of fine arts, school of arts and trades for men, and a similar institution for women; school of commerce and administration, National conservatory of music, preparatory school, schools for the blind, for deaf-mutes, reform schools, naval and military schools, etc., besides 22 museums and 61 libraries, containing from 500 to 180,000 volumes.

In his last message to Congress, April 1, 1904, President Diaz makes the following statements with reference to education:

"The last school census, taken at the end of 1902, shows that in the Federal District there were 54,052 children of school age, and 15,700 in the Territories. The Government has at present 498 schools, of which 337 are in the Federal District, 103 in the Territory of Tepic, 45 in Lower California, and 13 in Quintana Roo.

"The Government makes constant efforts to improve the standard of education and to enforce the precept of compulsory education. Last year 8,000 parents or guardians were fined for neglect, after being admonished once to send to school the minors for whose education they are responsible."

The Government has sent to New York, to study the best systems of manual training, a special commissioner to gather information and all necessary data to develop manual training in México. A dental faculty has been created for the first time.

Museums.—There are throughout the country 37 museums, 8 devoted to archæology and antiquities, 8 to natural history; 3 medical museums, one each devoted to physical science, geology and mineralogy, agriculture, industries, and commerce, and 13 to miscellaneous objects.

Libraries.—The total number of libraries is 124, the principal being the Biblioteca Nacional in México City, with 180,000 volumes; Biblioteca Pública de Guadalajara, State of Jalisco, 53,000; Biblioteca del Seminario, Morelia, Michoacán, 32,000; Biblioteca Palafoxiana, Puebla, 27,000; Biblioteca Lafragua, Puebla, 24,000, and Biblioteca del Colegio del Estado, Guanajuato, 21,000.

Scientific and Literary Associations.—The number of these institutions on December 31, 1902, was 44, of which 15 were supported by the Government.

Publications.—Official statistics show that there are 477 newspapers printed in the Republic, as follows: In the Federal District, 146; in Jalisco, 44; in Michoacán, 31; in Tamaulipas, 23; in Veracruz, 23; in Chihuahua, 21; in Puebla, 18; in Guanajuato, 18; in Yucatán, 16; in Coahuila, 16; in Sonora, 14; in Sinaloa, 11; in Durango, 11; in San Luis Potosí, 9; in Nuevo Leon, 9; in Colima, 8; in Zacatecas, 7; in the State of México, 6; in Oaxaca, 6; in Aguascalientes, 5; in Lower California, 5; in Hidalgo, 4; in Tlascala, 3; in Campeche, 3; in Guerrero, 3; in Morelos, 3; and in Chiapas, 1. This gives a measure of the progress attained by the different States of the Republic. Of these only 139 are considered first-class publications, as follows: In the Federal District, 57; in Jalisco, 5; in Michoacán, 3; in Tamaulipas, 2; in Veracruz, 5; in Chihuahua, 7; in Puebla, 2; in Guanajuato, 1; in Yucatán, 8; in Coahuila, 6; in Sonora, 7; in Sinaloa, 7; in Durango, 3; in Aguascalientes, 1; in Hidalgo, 1; in Guerrero, 1; in Tabasco, 1; in Campeche, 1; in Guerrero, 1; and in Morelos, 1.

The number of publications entered in the Mexican post-office during 1902 was 273, divided as follows: Two hundred and sixty printed in Spanish, 7 in English, 4 English and Spanish, and 2 Italian. There were 20 daily papers, 147 weeklies, 39 monthlies, 35 fortnightly, 9 biweekly, 1 quarterly, and 22 published at different times. As regards the character of these publications the division is as follows: Three

official, 61 political, 21 religious, 26 scientific, 53 literary, 61 general information, 12 commercial, 22 artistic, 4 musical, and 9 miscellaneous.

RELIGION.

Roman Catholic Church.—The prevailing religion in México is the Roman Catholic, the church being governed by a number of archbishops and bishops. The foundation of the church in the country may be said to date back to 1517, in which year Yucatán was discovered by Don Francisco Hernandez de Córdova, a rich Cuban merchant. Córdova, with 110 Spaniards, reached Cape Catoche during April of 1517, and soon gave battle to the inhabitants, killing 15 and capturing 2. The invaders were accompanied by a priest named Alonzo Gonzales, a native of Santo Domingo, who during the engagement carried from a heathen temple the idols therein preserved and, the fight ended, made the temple a Christian church, dedicating it under the invocation of *Nuestra Señora de los Remedios* (Our Lady of Succor), the patron saint of the Spaniards. The two captives, named Melchor and Julián, were purged of their sins, baptized, and made Christians, becoming the first converts of the New World.

Pope Leo X, by bull of January 27, 1518, created the bishopric of Yucatán, appointing to the see the Dominican Fray Julián Garcés, at the time bishop of Cuba, but he never entered his diocese, owing to the Spanish conquest extending at the time into México, and operations in Yucatán being abandoned. On October 13, 1525, Pope Clement VII appointed Garcés to the newly created see of Puebla, under the official title of bishop of Puebla, Yucatán, Chiapas, and Oaxaca.

The first bishop of México, with the title of bishop-elect and protector of the Indians, was Fray Juan de Zumárraga. This functionary destroyed many of the ancient picture writings of the Aztecs. He arrived in Veracruz in December, 1528, and was made bishop of México, suffragan to the archbishop of Seville, by bull of September 2, 1530. In 1545 the Mexican bishopric was made independent, and by bull of January 31, 1545, it was erected into an archbishopric, with bishop Zumárraga as archbishop. In the year 1571 the archbishop of México was made primate of New Spain, and on March 16, 1863, Pius IX divided the Mexican church into three archdioceses. These were the eastern, or that of México; the central, or that of Michoacán; and the western, or that of Guadalajara. The various bishoprics of México are suffragan to these archbishoprics.

The Holy Office of the Inquisition founded its first tribunal in the City of México in the year 1571, with Don Pedro Moya de Contreras as Inquisitor-general of New Spain, Guatemala, and the Philippine Islands. The first burning place in the City of México was situated near the church of San Diego, upon land now included in the Ala-

meda. The first *auto-da-fé* took place in 1574, when twenty-one persons were incinerated for the cause of religion.

On May 31, 1820, the inquisition was suppressed forever in México. The last *auto-da-fé* took place on November 26, 1815, the accused being the patriot Morelos, who, having been turned over to the secular authorities, was shot on December 22, 1815.

The finest edifices in the Republic were erected by the Roman Catholics, and it is estimated that up to 1859 one-third of the real and personal property was owned by the church. The cathedrals and churches, convents and monasteries, were solidly, massively built, and the interiors of the cathedrals and churches were magnificently decorated, gold and silver being lavishly employed in embelishing them.

The three orders of the Franciscans, Dominicans, and Jesuits were the most prominent in firmly fixing the power of Spain in México and fostering learning in the land, but the absorption of so considerable a portion of the wealth of the colony and the blocking of the channels of trade consequent on the locking up of capital brought about the suppression of religious orders in the Republic. The Jesuits were finally expelled from the country in 1856, and all the remaining orders had been abolished on Mexican territory by December 27, 1860, through the efforts of the liberal forces headed by Juarez. The laws of reform incorporated into the Federal constitution December 14, 1874, suppressed the last remaining female religious establishments—the Sisters of Charity.

The number of vicarages and parishes, Roman Catholic churches and chapels in México in 1897, is given in the following table:

Diocese.	Seat.	Vicarages and parishes.	Churches and chapels.	Total.
Archbishopric of México	México	203	1,654	1,857
Bishopric of Puebla	Puebla	187	2,513	2,700
Bishopric of Oaxaca	Oaxaca	134	1,000	1,134
Bishopric of Chiapas	San Cristobal	40	500	540
Bishopric of Yucatán	Mérida	84	234	318
Bishopric of Tabasco	San Juan Bautista	12	100	112
Bishopric of Tulancingo	Tulancingo	70	400	470
Bishopric of Veracruz	Jalapa	64	100	164
Bishopric of Chilapa	Chilapa	75	379	454
Bishopric of Tamaulipas	Ciudad Victoria	39	41	80
Archbishopric of Michoacán	Morelia	58	300	358
Bishopric of San Luis Potosí	San Luis	53	171	204
Bishopric of Querétaro	Querétaro	29	107	136
Bishopric of León	León	23	100	123
Bishopric of Zamora	Zamora	36	100	136
Archbishopric of Guadalajara	Guadalajara	106	376	482
Bishopric of Durango	Durango	45	250	295
Bishopric of Linares	Monterey	36	135	171
Bishopric of Sonora	Culiacán	55	200	255
Bishopric of Zacatecas	Zacatecas	20	100	120
Vicarage Apostolic of Lower California			3	3
Total		1,349	8,763	10,112

OTHER RELIGIONS.

Independence of thought in religion may be said to have had its beginning in México as far back as the year 1770, when Bishop Fabián,

of Puebla, under the auspices of Archbishop (afterwards Cardinal) Lorenzana, published his "Missa Gothica seu Mozarabica," which was a liturgy used in Spain by the Gothic Christians prior to the adoption of the Roman liturgy. Liberal ideas grew very slowly, but received considerable impulse when, in 1824, México gained her independence from the mother country. Juarez and the "laws of reform" further invigorated these ideas, which grew more and more until about 1860, when the first Protestant missionary, Miss Matilde Rankin, commenced her labors in the Mexican field, which resulted in a short time in the formation of 14 Protestant congregations.

Christian Church.—The first movement toward the formation of a Christian Church distinct from the Roman Catholic which came to a successful issue was begun in the country in 1868, when aid was asked of Protestants in the United States. The aid being afforded, there was organized in 1869 in the City of México what was called "The Church of Jesus in México," which, however, was not the result of missionary work so much as "a spontaneous movement originating among members of the Roman Catholic Church" in the country who desired "a greater liberty of conscience, a purer worship, and a better church organization."

The Rev. Henry C. Riley, a clergymen of the Protestant Episcopal Church in the United States, went to México, in 1869, and entered heartily into the work of "The Church of Jesus." In the same year the great Church of San Francisco, as well as the chapel of Balvanera, were purchased by the Protestants, and services were conducted therein in Spanish and English.

These buildings, formerly Roman Catholic churches, were purchased at an expense of $50,000, and in addition to this, during the five years that the society continued in charge of the work, more than $83,000 were expended in the support of missionaries. More than 3,000 persons connected themselves with the movement, and in 1873 the society deemed it expedient to transfer the work to the board of missions of the Protestant Episcopal Church. Subsequent to this the Reverend Doctor Riley was consecrated bishop of the Valley of México; but in April, 1884, after Bishop Riley's resignation, the American bishops recognized the *Cuerpo Eclesiástico*, composed of the clergy and readers, as the ecclesiastical authority of the Mexican Church.

The Church of San Francisco is a historic building. It was dedicated December 8, 1716, but the original monastery and church, whose site this edifice occupied, was built about 1607 on lands which had formerly been the garden and wild-beast house of the kings of Tenochtitlán. Cortés provided funds for the building of the first church, and material was secured in the hewn stone from the steps of the great *Teocalli* (the Aztec temple). In this church Cortés heard masses, and for a time his bones found a resting place. Here the Spanish viceroys,

through the centuries, took part in the great festivals of the church. The *Te Deum* in celebration of Mexican independence was first echoed by its walls. Here the liberator, Agustín de Yturbide, worshipped, and here his funeral services were held when he died; and here, to-day, Protestant services are held.

Three churches now stand on portions of the land covered by what were known formerly as the seven churches of San Francisco. They are the Church of Jesus; Christ Church, where the services of the Church of England are held, and the Methodist Episcopal Church of the Trinity.

In 1891 the Mexican Church elected the presiding bishop of the American Church as the provisional bishop of the former, and took as its name "The Mexican Episcopal Church of Jesus." The general convention has commended the church work in México, and since then the Mexican Church has reorganized itself, substituting for the *Cuerpo Eclesiástico* a synod composed of the clergy and lay representatives from the congregations. It has adopted a body of canons for its government and has also officers for the administration of baptism, confirmation, and communion, for marriage and burial, for daily morning and evening prayer, etc. Two men have been ordained to the priesthood and seven to the deaconate.

The Mexican Episcopal Church is no longer an American mission, although the contributions of American church people are supporting the work.

The church has stations in several States and the Federal District, having a large membership.

Presbyterian Church.—The missionary work of the Presbyterian Church in México began in 1874 and to-day is in a flourishing condition, having both foreign and native preachers, missionaries, churches, Sunday, boarding and day schools, and a large number of communicants, adherents, native workers and pupils in the schools.

Methodist Episcopal Church.—The Methodist Episcopal Church South laid its foundation in the City of México in 1873. There are now three mission conferences in México, representing the fruits of unceasing toil and heroic devotion.

This church claims that a Mexican, Sóstenes Juarez, was the first man who held Protestant services in México. That in 1865 a band of seven met in a room on the Calle San José Real, in the City of México, and organized the first Protestant Church in México. It was called The Society of Christian Friends.

Data kindly furnished by the Missionary Society of the Methodist Episcopal Church show a very flourishing condition of affairs. This organization has in México 141 congregations, 45 churches, 38 parsonages, 1 theological school, 6 high schools, and 51 day schools. It employs 31 missionaries, 53 native preachers, and 65 teachers in its

various schools. There are 2,908 church members, over 12,000 adherents and probationers, 70 Sunday schools with 2,900 scholars, while in the other schools there are 3,300 students.

The value of the church property, parsonage, and other buildings is about $706,000.

The society also maintains a publishing house which during 1902 published Sunday school lesson papers, hymnals, tracts, etc., to the number of 5,153,200 pages.

Two distinct missionary organizations of the Baptists of the United States are prosecuting missionary work in México independently of each other, although the best of relations exist between them. These are the American Baptist Home Missionary Society and the Foreign Mission Board of the Southern Baptist Convention.

Statistics of the Protestant work in México for 1900, kindly furnished by the Board of Foreign Missions of the Presbyterian Church, show that during the year in reference there were 210 foreign missionaries, of which 130 were women; 547 native workers of both sexes; 20,769 communicants; 17 adherents, not communicants, making a total of 37,769 native constituency. There were 434 substations, 148 day schools with 7,073 pupils, 18 higher institutions with 2,217 students, and 4 hospitals or dispensaries.

CHAPTER XVII.

PATENT AND TRADE-MARK LAWS.

The first patent law of México was framed and issued in 1832, but it was not until 1886 that any remarkable activity was noted in this branch of development, as in the years intervening between 1832 and 1853 not a single patent was granted. From 1854 to 1875 the entire number issued was only 41; from 1876 to 1885 there were 360; 102 in 1886, and from that time until 1889 the patent grants numbered 406.

The patent law of June 7, 1890, amended June 6, 1896, has been repealed by law of August 25, 1903, now in force.

PATENT LAW.

The new patent law of the Republic, promulgated August 25, 1903, contains 121 articles. The salient points of the law are the following:[a]

Anyone who has made any new invention of an industrial character may acquire the exclusive right, by virtue of the provisions of articles 28 and 85 of the Constitution, to exploit or work said invention for his benefit, during a certain term, under the rules and conditions prescribed by law. In order to acquire this right it is necessary to obtain a patent of invention.

The following are patentable:

I. New industrial products.

II. The application of new means in order to obtain an industrial product or result.

III. The new application of known means in order to obtain an industrial product or result.

The following are not patentable:

I. A discovery or invention that simply consists in making known or rendering evident something which had already existed in nature, although it had been unknown to man before the invention.

II. Every scientific principle or discovery of a purely speculative character.

III. Every invention or discovery, the exploitation of which may be contrary to the laws prohibiting same, to public safety or health, and to good customs or morals.

IV. Chemical products; but the new processes to obtain said products, or their new industrial application, shall be patentable.

[a]The full English text of the patent law and regulations was published in the Monthly Bulletin of this Bureau for December, 1903.

An invention shall not be considered as new whenever it has been put in use, in the country or abroad, before the application of the patent, for a commercial or industrial purpose, or when it has been so extensively published as to become of use, as in such cases it shall be regarded as public property.

In the following cases the foregoing provisions shall not apply to the author of the invention nor to the owner of the patent obtained abroad:

I. When the publicity is derived from the exhibition of the invention in a local, State, or international exposition, officially or unofficially recognized, provided that before its exhibition the document prescribed by the regulations shall be deposited in the Patent Office and the proper application filed in said office within three months after the official closing of the exposition.

II. When the owner of a foreign patent shall file his application for a Mexican patent to be issued within a period of three months from the date on which, in accordance with the law of the country in which the foreign patent was issued, the invention shall be made public.

In case there are two or more foreign patents, the term of three months shall be reckoned from the date of the patent which was first published.

III. Whenever the application shall be filed within the terms specified by the international treaties relating to the matter, or within the twelve months to which article 12 of the law refers.

The owner of a patent shall have the exclusive right:

I. To exploit or work the same, for his benefit, during the time fixed by law, either by himself or through other persons with his consent.

II. To prosecute before the courts those who infringe his patent rights, either because of the industrial manufacture of the patented article, or by the industrial employment or use of the patented process or method, or because they may keep in their possession or offer for sale, sell, or introduce for a commercial purpose in the national territory, without his consent, one or more manufactured articles.

In the case of industrial manufacture the intent to defraud shall not be necessary to incur in a penal offense, although said fraudulent intent must exist in the other cases provided for in Section II.

The patent shall produce no effect whatever.

I. Against similar articles that may, in transit, pass through the national territory or tarry in its territorial waters.

II. Against a third party who was already exploiting the same patented article in the country prior to the date on which the application for the patent was filed or on which he had made the necessary arrangements to exploit it.

III. Against a third party who, for the purpose of making experi-

ments or investigations, should construct an article or put in use a process equal, or substantially equal, to the patented one.

A patent may be granted to two or more persons jointly should it be jointly applied for.

Those desiring to obtain a patent shall file at the Patent Office an application, accompanied with the following documents:

I. A specification.

II. A set of claims.

III. A drawing or drawings, should the case require it, at the discretion of the inventor.

IV. Two copies of the above documents.

The Patent Office shall make an official examination of the documents filed in order to determine if they are complete and whether they comply with the requisites prescribed by the proper regulations concerning the form thereof.

If upon examination the Patent Office finds that said documents do not comply with the requirements, or that the article or thing sought to be patented is not patentable, it shall dismiss the petition and so notify the interested party. If this is not satisfactory, he may appeal to the courts in accordance with the provisions of Chapter XII of the law. Should the Patent Office be satisfied with the documents filed, it shall so notify the interested party.

The legal date of a patent is that of the legal filing in the Patent Office of the application and documents which constitute the same; and from that date the patent is supposed to be granted and produces its legal effects, except as specified above.

The legal date of a patent solicited in México, and which has already been applied for by the same person in one or more foreign countries, shall be that which corresponds to the foreign patent first solicited, provided that it be applied for in México within twelve months from the date of the first application abroad, if it is a patent of invention, and within four months from the same date if the application is by means of an industrial design or model, and provided also that the foreign country in which it was first applied for grants this same right to Mexican citizens.

Patents shall be granted without prejudice to third parties and without guaranteeing their novelty or utility. The concession thereof only gives a presumption of said qualities and of the rights of the owner until the contrary is proven.

Any person other than the author of an invention applying for a patent must prove his authority as representative or attorney of the inventor by means of a letter of authorization, signed by the inventor or author of the invention and two witnesses. The Patent Office, however, reserves the right to demand the ratification of the signatures whenever it should deem it convenient to do so.

Patents of invention are granted for a term of twenty years from their legal date. This term is divided into two terms, the first consisting of one year and the second of nineteen years. The tax for the first period, or one-year, term is 5 pesos, and for the second term 35 pesos. The regulations shall fix the Government fees for issuing copies, certified copies, renewal of title deeds, etc. The term of twenty years may be extended five years longer at the discretion of the Chief Executive after the payment of the proper additional fees. To obtain this extension an application must be filed with the Patent Office within the first six months of the last year of the ordinary term of twenty years, as required by law.

The exploitation of a patent is not obligatory, but if after three years from the legal date thereof said patent should not be industrially exploited within the national territory, or if after these three years the exploitation of the same shall have been suspended for more than three consecutive months, the Patent Office shall have the right to grant to third parties a license to make said exploitation.

The owner of a patent has the right to prosecute before the courts as an usurper of his patent rights or as an illegal exploiter thereof the owner of a license granted by the Patent Office who had not commenced the exploitation within the term of two months fixed by law, or who had suspended the exploitation during a period exceeding two consecutive months, and who, notwithstanding said fact, had been exploiting said patent, except when said suspension of the exploitation had been caused by accident or by main force. All the products protected by a patent shall bear a mark to indicate the fact that the article is patented, as well as the number and the date of the patent.

Patents shall be issued by the Patent Office in the name of the President of the Republic and be signed by the Secretary of Fomento. Patents shall state:

The number of the patent,

The name of the person or persons to whom the same is granted;

The term of the patent;

The article for which it has been granted;

Its legal date and the date of its issuance;

And to the patents shall be affixed the special seal of the Patent Office.

The patent, together with a copy of the specification, the claims, and drawings, should there be any, shall constitute the title deed which shall prove the rights of the patentee.

The patent protects only what is contained in the claims, the specifications and drawings, if any, serving only to explain what said claims contain.

The Patent Office shall publish in the "Gaceta Oficial de Patentes y Marcas" (Official Gazette of Patents and Trade-Marks), at least every

two months, a list of the patents granted, and at least annually a special book containing the claims and one or more drawings of each patent.

The Patent Office shall, upon request of the interested parties concerning the novelty of a patent applied for, make an examination without guaranty, and report in writing the result of this examination, which may also be made upon the request of any person, for the purpose of ascertaining whether the article sought to be patented has already been patented, or whether it has become public property in México.

The rights acquired by virtue of a patent may be transferred, in whole or in part, by any of the legal means established by law, as in the case of any other right, providing it does not injure the rights of a third party.

A patent of invention may be expropriated by the Federal Executive, on the ground of public utility, by causing the respective invention to become at once public property, after due indemnification, subject to the same requisites established by the law for the expropriation of real estate.

In the case of invention of a new weapon, instrument of war, explosive, or, in general, of any improvement in machines or munitions of war which may be applied to the national defense, and which, in the opinion of the Chief Executive, should be kept as a secret of war, and therefore only be used by the National Government, said expropriation shall embrace not only the patent but also the invention, even though it may not have yet been patented. In this case said invention, as well as the respective patent, shall not be made public, but it becomes the exclusive property of the Government.

Patents shall be considered void—

I. At the expiration of the first term, one year, if the fees of the second payment have not been paid.

II. Upon the expiration of the second term.

III. Upon the expiration of the term of extension, when an extension has been granted.

Patents are void—

I. Whenever they are in contravention of the provisions of law.

II. When the claims are not sufficiently clear and explicit, thereby rendering it difficult or impossible to determine what is claimed as new.

III. When there is not sufficient clearness and precision in the specification and drawings so that, in the opinion of the expert, said specification and drawings are not sufficient, taken as a whole, to construct or produce what they purport to describe.

IV. Whenever the object attained by virtue of the patent differs from that sought to be obtained.

V. Whenever another like patent has been previously granted, in the country or abroad, though the same has been declared void.

A patent can only be annulled by judicial authority, and then only by reason of any of the causes enumerated.

The penal and civil responsibility of infringers, and the procedure to be observed both in criminal and civil actions, embrace 52 articles of the new patent law, the matter being exhaustively treated.

In regard to patents by industrial samples or drawings, is patentable every new form of an industrial product, piece of machinery, tool, statue, bust, high or low relief, which, either by its new artistic arrangement or by the new arrangement of the material, constitute a new and original industrial product. Any new drawings used for the purpose of industrial ornamentation, in any substance, and arranged thereon by printing, painting, embroidering, knitting, sewing, molding, casting, engraving, mosaic, inlaying, embossing, discoloration, or any mechanical, physical, or chemical means, in such manner as to give to the industrial products used in the drawings a peculiar and becoming appearance, shall also be patentable.

Whenever a patent is applied for by means of an industrial sample or drawing, a sample or model shall be sent to the Patent Office, in addition to the papers or documents specified in the law and regulations. In case the drawing or drawings illustrating the drawing or model sought to be patented are difficult to copy, the Patent Office may accept photo-engravings or photographs. It shall also dispense with the model or sample when the execution of the same is difficult, and when the drawings are sufficient to give an accurate and precise idea of the invention.

Patents applied for by means of industrial drawings and models shall be granted for a term of five or ten years at the option of the applicant. These terms can not be extended.

The fees charged for patents applied for by means of industrial drawings or models are the following:

I. For five years, 5 pesos.

II. For ten years, 10 pesos.

The above fees shall be paid in Federal revenue stamps in the manner prescribed by the regulations.

Patents applied for by means of industrial drawings or models lapse when the term for which they were granted expires. All the provisions relating to patents of invention are applicable to those of industrial models and drawings, except as provided by law.

This law went into force on the 1st of October, 1903.

Regulations.—The regulations, consisting of 38 articles, were promulgated by Executive decree of September 24, 1903, and in general terms provide that whoever desires to obtain a patent shall file personally, or by means of an attorney, in the Patent Office, an application

accompanied by the following documents: I. A description; II. A claim; III. A drawing or drawings, if the same require it; and IV. Two copies of these documents.

A receipt shall be given to the applicant of the documents presented stating the date and hour in which they were filed, their serial number, and the term within which the interested party shall appear or present himself in the Patent Office to be notified of the result of the examination and when to pay the required fiscal fees. Should the interested party fail to comply with the terms and requirements set forth in this receipt, the case shall be considered as abandoned.

The application shall be made according to the models annexed to the regulations. When a patent is jointly applied for by several persons, there must be stated in the respective application, in the first place, the name of the person who represents the others, and it must so be set forth in the specifications.

The specification must begin with the name of the inventor or inventors, profession, if he or they have any, nationality, domicile, and address in the City of México for receiving notifications; the name, nature, and object of the invention, with an enumeration of the drawings.

After this the invention must be described in a complete, clear, and exact manner and as concisely as possible, avoiding all kinds of digressions and adhering strictly to the object thereof. Under no pretext shall an attempt be made to give a demonstration of a mathematical, philosophical, or of any other nature whatever, concerning what is described or affirmed. At the end of the specification the claim must be added signed by the inventor or his representative.

The models provided for by the regulations must be strictly followed.

The claim must define and express clearly and with all exactness the process, combination, or product which constitutes the invention or the organ or piece that forms the essential part of the invention, indicating at the same time the relation which it may have to another or other organs or elements which are not the direct object of the patent.

The drawings must be made on white paper of the thickness of three-sheet Bristol board having a smooth and compressed surface approximately 380 millimeters in height by 254 millimeters in width. A heavy line 25 millimeters from the edge of the paper shall form a frame or body within which the drawing must be made. In the upper part of this frame or body and within it shall be left a blank space of 25 millimeters approximately, in order that the Patent Office may place therein the name of the invention, the serial number of the same, etc. The interested party shall write with a soft pencil on the back of the sheet the title which he has given to his invention.

In the lower part of the body or frame, and to the right side, he shall sign.

The requisites governing the drawings are set down as follows in the regulations:

"(*a*) Preferably care should be taken so that one of the narrow sides of the paper remains as the upper part thereof, but if it be considered better to take one wide side of the paper as the upper side thereof it may be done.

"(*b*) If a sheet is not sufficient several may be used, but in at least one of these the complete invention must appear.

"(*c*) Only China ink and graphite shall be used, taking care that the ink be absolutely black. Shading should be avoided as much as possible, and whenever the same is absolutely necessary it should be done with the least possible number of lines.

"(*d*) It shall be assumed that the light comes from the left side upper angle of the paper at 45°, so that the lines formed on the side of the shade shall be represented heavier than those on the side of the light.

"(*e*) It is preferable at all events and is specially recommended to present the invention in one single drawing of the largest possible size, in a conventional and free perspective view, without the necessity of being subjected to any scale, not even among the parts of one and the same figure, considering always that what is desired above all things is clearness.

"(*f*) If it is considered necessary to show one or several sections, they must be indicated in the general drawing by means of dotted or dash lines, or dash and dotted lines, always taking care to mark in the section the reference sign or letter of the line to which it corresponds.

"(*g*) The pieces shown in section must be marked by means of oblique lines at least 1.5 millimeters from each other.

"(*h*) The signs must be letters or numerals the size of which in no case shall be less than 3 millimeters. If there are places where they can not be put or where it is feared that they may cause confusion, they should be placed as near as possible and united to the point which they indicate by the broken or curved line.

"(*i*) If in spite of this it is necessary to place a sign or letter in a space marked by means of oblique lines, a small circle must be left in blank in order to place in it the sign.

"(*j*) Whenever there are pieces or details, which in general figure are shown too small, they must be marked by means of only one letter or sign and present them sufficiently amplified in special figures marked by the same sign."

The duplicate must be made on tracing cloth and with China ink.

Whenever in the patents solicited by means of drawings or models, photographs instead of drawings are admitted, the latter and their duplicates shall be made precisely on blue paper or other unalterable

heliograph. The paper must be of the dimensions already stated and a negative shall be delivered, made on a film, preferably thick.

Drawings shall not be folded, but shall be presented stretched between two thick pieces of pasteboard. The indications of the drawings annexed to these regulations shall be followed in toto.

Two or more independent inventions can not be patented in one single patent.

In general terms, "Every organ or conjunction of organs which are susceptible of exploitation separately and the utilization of which is not absolutely obligatory with the machine in which they are used constitutes the object of an individual patent."

A machine and its products must be the subject-matter of independent patents, as well as a machine and the process in which it is used, but a process and its products may be patented only in a single patent.

An industrial drawing and the process to obtain the same, as well as an industrial model and the process to obtain the same, are subject-matter of two independent patents.

In all doubtful cases two or more patents should be solicited.

If the result of the examination provided in the law and regulations should be satisfactory, the interested party must present to the Patent Office, within the term fixed in the receipt of documents, a 5-peso stamp bearing the seal of "Patents" (Patentes) in payment of the Government or fiscal fee for the first term or installment of one year.

Any working day during the first term of one year the interested party may ask for the final patent. In order to do this he must present in the Patent Office three 10-peso stamps with the stamp "Patents," and one 5-peso stamp equally stamped.

Patents shall be inscribed in a special register or record.

Under no pretext whatever shall it be possible to demand the return of documents of any kind or the fees paid in cases of forfeiture, annulment, abandonment, or when for any other motive or reason the patent should not be declared in force. Neither shall anyone have the right to demand the return of the copy or model that he may have delivered to the Patent Office.

In case the title of ownership of a patent is lost or destroyed its renewal may be requested. In order to do this the interested party shall cause a copy of the description, claim, and drawings to be made at his expense, and shall pay as fees 15 pesos in stamps with the stamp "Patents" (Patentes), and he shall affix said stamps to the document that may be indicated to him, duly canceling them. The new title deed shall state the fact that it is a duplicate.

The application, the description, claim, and their duplicates as well as all the documents, notes, etc., presented to the Patent Office shall be written only on one side and on paper 330 by 215 millimeters, writ-

ten on a typewriter, in blue or dark violet fixed ink, or well printed. To the left a margin should be left equivalent to one-fourth the width of the paper.

TRADE-MARKS.[a]

The trade-mark law in force was officially promulgated by Executive decree on August 25, 1903, and contains 93 articles. The following are the principal provisions of the law:

A trade-mark is the characteristic and peculiar sign or name used by the manufacturer, agriculturist, or merchant in the articles which he produces or sells for the purpose of distinguishing them and to indicate their origin. A trade-mark may be especially constituted by the names under a peculiar form, the denominations, labels, wrappers, packages or holders, stamps, seals, vignettes, borders, raised embroidery, filigree, engravings, coat of arms, emblems, reliefs, figures, mottoes, etc., it being understood, however, that this enumeration is simply made for the purpose of illustration, the application of trade-marks not being limited to said articles.

To obtain the exclusive rights to the use of a trade-mark it is necessary to register the same in the Patent and Trade-Mark Office and otherwise comply with the formalities established by the law and regulations.

To register a trade-mark the applicant must file with the Patent and Trade-mark Office an application, accompanied by the following:

I. A description of the trade-mark, containing the proper reservations of the same. Said description shall also contain the following data: The name of the owner, the name of the manufactory or business, should he have any, the place where the latter is situated, and the description of the articles or products to which the trade-mark shall be applied. Should the interested party deem it necessary, a description and drawings of said articles or products may also be attached.

II. Two copies of the description;

III. A facsimile or cut of the trade-mark; and

IV. Twelve samples of the trade-mark, exactly as the same shall be used.

Any Mexican or foreigner can register a trade-mark by applying to the Patent and Trade-mark Office, either in person or through an attorney. Corporations, companies, and all other legal entities generally have the same right. The representation and qualification of an attorney may be verified by a simple letter, serving as a power of attorney, signed before two witnesses, and the office may demand the

[a] The full English text of the law and regulations was published in the Monthly Bulletin of this Bureau for December, 1903.

ratification of the signatures of said letter whenever it may deem it convenient to do so.

The following can not be registered as trade-marks:

I. The names or titles, whether the trade-mark protects articles which are comprised in the description or kind to which the name or title refers, inasmuch as the essential requisite, in order that a title or name may serve as a trade-mark, is that it be capable of indicating or distinguishing the articles thus protected from other articles of precisely the same description or kind.

II. Anything that is contrary to morals, good customs, or to the laws of the country, and everything that may tend to ridicule ideas, persons, or articles worthy of consideration.

III. The national coat of arms, escutcheon, and emblems.

IV. Weapons, escutcheons, and emblems of the States of the Federation, national or foreign cities, foreign nations and states, etc., without their respective consent.

V. The names, signatures, seals, and pictures of private persons, without their consent.

The registration of a trade-mark shall be renewed every twenty years. Delay in making said renewal shall not result in the loss of the rights to the exclusive use of the trade-mark, but the party thereby incurs an increase in the Government fees in accordance with the provisions of the regulations, and until the renewal takes place the interested party has no right to bring a criminal action against or prosecute those who should improperly use or counterfeit the trade-mark.

The registrstion of a trade-mark shall commence to be in force from the date on which the respective application and documents shall have been duly filed with the Patent and Trade-mark Office.

A trade-mark, the registration of which is applied for in México within four months after having been applied for in one or several foreign countries, shall be regarded as having been registered on the same date in which it was registered in the first foreign country where it may have been previously registered, provided that country grants the same right to Mexican citizens. Hence every trade-mark registered in México under these conditions shall have exactly the same power and shall produce the same effect as if it had been registered on the same day and hour in which it was registered in the first foreign country.

Registered trade-marks shall bear visible inscriptions, as follows:

Those used by manufacturers, merchants, agriculturists, etc., "Registered Trade-mark," or the same words written in abbreviation, together with the number and date of the registration. Those used by merchants shall read "Registered Commercial Trade-mark," or the same words written in abbreviation, together with the number and date of the registration.

Whenever the trade-mark consists of names, titles, inscriptions, monograms, or abbreviations, etc., or when consisting of signs which are not letters, should bear the names, titles, etc., or monograms or abbreviations, the trade-mark shall necessarily bear in a conspicuous or visible manner the name of the owner of the industry or trade, the name of the business, manufactory, etc., should he have any, and the place where the latter is situated.

The registration of a trade-mark shall be made without an examination as to its novelty under the exclusive responsibility of the applicant and without prejudice to third parties, and such registration shall be void whenever the same has been made in contravention of the provisions of the law and the regulations, or when it had been previously registered by somebody else, if more than two years have elapsed since registration, or the two years not having yet elapsed, another had made the registration with a better right.

The certificate of registration of a trade-mark shall be issued by the Patent and Trade-mark Office. This certificate duly legalized, together with the documents attached thereto, constitutes the title which proves the right to the exclusive use of the trade-mark.

Registered trade-marks can be transferred and sold or disposed of like any other right, as provided by law. The transfer shall be registered in the Patent and Trade-mark Office, and without this requisite it shall have no effect against a third party. The transfer of a trade-mark implies or carries with it the right of industrial or commercial exploitation of the industrial product or commercial articles protected by said trade-mark.

Civil and criminal actions growing out of the infringement of the trade-mark law and the penalties attached thereto are fully set down in the act in question.

The fees for registration and publication of trade-marks are as follows: A fee of 5 pesos for the registration or extension of time of a trade-mark; a fee of one peso for the publication of a commercial name.

The following fees shall be charged for the registration of a commercial advertisement: Two pesos for a five years' registration; 4 pesos for a ten years' registration; 4 pesos for each extension of time of five years.

These fees shall be paid in internal-revenue stamps, in the form and manner prescribed by the regulations of this law. Said regulations fix the fees which the Patent and Trade-mark Office shall charge for other services, such as registration of transfers, change of place, renewals of the certificates of registration, etc., which fees are also paid in internal-revenue stamps.

This law went into effect on the 1st of October, 1903.

Regulations.—The regulations promulgated on September 24, 1903, provide in general terms that the registration of trade-marks and notices shall be made by the Patent and Trade-Mark Office at the request of the interested party. For each registration of trade-marks and notices sought to be made, a separate application shall be made, according to the model, provided by law.

The Patent and Trade-Mark Office shall issue a receipt for the documents and cliché to the interested party, stating the day and hour in which they were delivered and the respective serial number. The Patent and Trade-Mark Office shall make an official examination of the documents in accordance with the law. If the result of the official examination is satisfactory the interested party shall present to the Patent and Trade-Mark Office, within the term stated in the receipt for the documents, the stamp with the restamp "Marcas" (Marks) corresponding to the payment of the fees, said stamp to be canceled on the document. If the applicant fails to do so within the term fixed in the receipt issued for the documents, it shall be understood that the case has been abandoned.

If the Patent and Trade-Mark Office finds that the documents presented are not prepared in due form, it shall make known the fact in writing to the interested party, so that he may renew them or proceed in the manner indicated in article 39, Chapter III, of the law.[a]

The descriptions of the trade-mark, the registration of which is solicited, must be authorized by the signature of the interested party or that of his attorney, and in case said description consists of several pages or folios, each folio or page must be signed on the margin.

All applications and other documents presented for the registration of a trade-mark or notice shall be typewritten on one side of the paper only, in indelible black, blue, or dark violet ink. The paper used must be 330 millimeters in length, 215 millimeters wide, and have a margin of 54 millimeters on the left side. The length or width of the cliché for a trade-mark or notice shall be no less than 15 millimeters and no more than 100 millimeters, and the height thereof must be 24 millimeters. When a trade-mark is formed by several separated parts one cliché shall be sent for each of said parts. The colors shall be indicated in the cliché as far as may be possible. The copies of the original trade-mark law shall be free from erasures, corrections, or modifications.

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[a] The article in reference reads as follows:

"ART. 39. Whenever the interested parties should not be satisfied with the administrative decisions or decrees of the Department of Promotion or with those of the Patent and Trade-Mark Office they may appeal within fifteen days after being advised of the decision to any of the District Judges of the City of México, setting forth the reason of their nonconformity."

When metal objects or other substances constitute a trade-mark or a part thereof, there shall be sent, in addition, twelve copies of its illustration, printed on paper, as well as when the trade-mark is to be fixed by means of lead seals, by fire, or by any other process.

The certificate of registration of a trade-mark, besides the provisions of the law, must contain the following:

I. Ordinal number of the trade-mark.

II. Date and hour in which the application and annexed documents were presented.

III. The name of the owner of the trade-mark.

IV. The seal of the Patent and Trade-Mark Office.

V. A facsimile of the registered trade-mark.

VI. A description of said trade-mark.

In case the certificate of registration should be lost or destroyed it may be renewed at the expense of the owner of the trade-mark. In order to do this he shall present a petition and three pesos' worth of stamps with the restamp "Marcas" (Marks), which he shall affix to the document indicated to him and shall cancel them thereon. In the new certificate shall be stated that it is a duplicate.

To solicit the registration of the transfer of a trade-mark, a petition shall be made to the Patent and Trade-Mark Office, stating:

I. The number of the registered trade-mark.

II. The name of the former owner.

III. The name of the trade-mark, should it have one.

IV. The products protected by it.

V. The name of the new owner.

This application shall be accompanied by stamps to the value of 3 pesos with the restamp "Marcas" (Marks), to be canceled on the document. With said petition shall be sent a facsimile of said trade-mark. In order to justify the acquisition of a trade-mark or notice, the original and a copy of the respective deed shall be sent. The original to be returned to the interested party, and the copy shall be kept as a part of the proceedings.

To obtain the registration of a commercial notice, there shall be presented at the Patent and Trade-Mark Office a petition, accompanied by the following:

I. A cliché of the notice.

II. Twelve copies of the notice or advertisement just as it is going to be used.

III. Twelve copies of the same notice printed on paper, when said notice is going to circulate, made in crystal (glass), sheet (plate), leather, pasteboard, etc.

The petition shall be made in accordance with the model, and 3 pesos' worth of stamps, with the restamp "Marcas" (Marks), shall be accom-

panied, if the registration is for five years, and 4 pesos in stamps, if the registration is for ten years. These stamps the interested party or his representative shall cancel on the document that may be indicated to him. The dimensions of the cliché of a commercial notice shall be the same as those fixed for the trade-mark.

Any document that does not fulfill the requirements of the law and the regulations shall be renewed at the expense of the interested party. Under no pretext whatever shall documents, drawings, stamps, cliché, or samples, which, for the purpose of obtaining the registration of a trade-mark or notice, may have been delivered to the Patent and Trade-Mark Office, be returned. The public may examine the registered trade-marks and notices (advertisements) at the hours fixed for that purpose by the Patent and Trade-Mark Office.

The number of patents issued and trade-marks registered by the Department of Promotion, from 1890 to the end of 1902, is officially given as follows:

Year.	Patents issued.	Trade-marks registered.
1890	63	97
1891	153	112
1892	168	161
1893	122	108
1894	125	79
1895	154	91
1896	150	101
1897	208	207
1898	232	235
1899	279	267
1900	278	236
1901	399	272
1902	488	357
Total	2,814	2,323

CHAPTER XVIII.

PRACTICE OF MEDICINE, DENTISTRY, ETC.—COST OF LIVING—WAGES TO LABOR—BUILDING, ETC.

Practice of medicine, dentistry, etc.—No person, whether a native or a foreigner, is allowed to practice in México medicine, pharmacy, obstetrics, or dentistry without positive proof that he or she is a graduate of a duly authorized college or university. Studies in México must be made at one of the schools, hospitals, or other institutions authorized by law, and when made in a foreign country they must be validated before the proper Méxican authorities, upon application to the Secretary of Justice and Public Instruction, and the proof, by the proper certificate, that they have been made in accordance with the provisions of the Méxican law. Validation thus granted exempts the candidate from the necessity of being examined.

The medical professions, as classified by the decree of January 11, 1902, providing for a "Plan of Studies for the National School of Medicine," are four, as follows:

I. Medicine and surgery;
II. Pharmacy;
III. Obstetrics;
IV. Dental surgery.

Medicine.—The course in medicine, covering a period of six years, embraces: Descriptive anatomy, with practical dissection exercises; general and histological anatomy, theoretical and practical, with the proper practical exercises; topographic anatomy, with practical exercises, and pathological anatomy; physiology, with experimental demonstrations; biological chemistry; galenic pharmacy; bacteriology; pathology, medical, surgical, and general; therapeutics, medical and surgical; theoretical obstetrics; clinics, internal, external, propedeutical, and surgical; medical pediatrical clinic; surgical gynecological clinics; clinic of ophthalmology; clinic of psychiatrics; legal medicine and deontology.

Pharmacy.—The course in pharmacy, covering a period of three years, embraces: Pharmacy; posology; pharmaceutical economy; legal pharmacy; deontology; chemical and pharmaceutical manipulations; practical management of the physical and chemical instruments and apparatuses used in pharmacy; natural history of the simple drugs

used in México; chemical analysis, general and applied to medicines; toxicology; and the examination of food and beverages, and of the principal physiological and pathological products. Practice in the Charity Central Dispensary or in the drug store of the Government hospital shall also be required as a condition for graduation.

Obstetrics.—The course in obstetrics, covering a period of two years, embraces: Anatomy and physiology of the feminine sexual apparatus, including the study of the pelvis; elements of embryology and fetal anatomy; pregnancy, labor, and puerperal conditions, physiologically considered; care required by the mother of the newly born child; obstetrical antisepsia; obstetrical hygienics; obstetrical therapeutics; obstetrical operations, with exercises on the manikin; and clinic, obstetrical and propedeutical.

Dentistry.—The course in dental surgery, covering a period of three years, embraces: Descriptive anatomy, with dissection exercises; topographical anatomy of the head, and especially of the mouth; histology, with special reference to the elements constituting the mouth; physiology; dental pathology; morbous processes in general; dental therapeutics; dental materia medica; dental surgery; dental operations; dental prosthesis; dental metallurgy; bacterioscopy.

Article 22 of the decree provides that the studies above described, whether purely preparatory or professional, made in a foreign country, may be validated by the secretary of justice and public instruction, upon such conditions as he may require.

Article 28, translated into English, reads as follows:

"ART. 28. Persons holding diplomas from official schools of the Republic, different from those designated by this decree, or from foreign universities, who may desire to obtain the same from the schools and institutions named in article 1 of this decree, for the practice of any of the medical professions established by this plan, shall subject themselves to examination, in the National Preparatory School or in the National School of Medicine, in every one of the matters or branches above described for each profession; and if approved they shall have to pass also the respective professional examination. But if the candidate should prove by a competent certificate to have studied some matters in conformity with the provisions of the Mexican plan, the said studies shall be validated and he shall be exempted from examination in the same. It shall not be necessary to take up the different subjects of examination in regular order."

Cost of living.—It may be said in a general way that the cost of living in México is not great, although, of course, it varies in different localities. In the interior towns and villages the common necessaries of life, such as beef, vegetables, etc., are cheap. Coffee and tea, the latter being very seldom used or seen in the interior, are expensive. Imported goods are also expensive, as to their cost in gold must be

JUÁREZ THEATER, GUANAJUATO.

added the import duties and the merchants' profits. The native food is rich and highly seasoned. Meals may be had at the hotels in the interior for about 50 cents each; board and lodging at these hotels range from $2 to $2.50 per day.

In the City of México, living is more expensive. Hotels charge from $2.50 to $10 silver per day. Good meals may be procured at any first-class restaurant for $1.

Ready-made clothing, such as is to be found in the United States, is not much in vogue, but imported English and French cloth is made up into suits at about the same cost as in the United States. The large dry-goods establishments, millinery stores, etc., are as well stocked as those of the larger cities of the United States, and for imported goods the prices vary very little from those prevailing in the latter country.

Rents in the City of México, however, are very high. This is due to the cost of house building, the municipal tax of 12 per cent on the annual rental, pavement, drainage, water, and stamp taxes. The expense in taxes on a house costing $10,000 to build, and renting for $75 per month, is $13.08 per month, or about 17½ per cent of the receipts.

There is not much money to be saved by hiring private lodgings unless it is proposed to take them for a protracted period. Furnished rooms in desirable localities cost nearly as much as hotel apartments. Although unfurnished rooms may be secured, the cost for furnishing them is very considerable; still they rent for about one-half the amount charged for furnished rooms. *Casas de huéspedes*, corresponding to the American boarding house, abound, but as a rule the meals served are not of the best. Their charges are relatively moderate. The hotels generally, in the smaller cities and towns, are not provided with baths, but in the City of México, as everywhere else, there are excellent public baths. The prices at these establishments are, usually, for cold baths, 1 real (12½ cents); for warm baths, 2 reales (25 cents).[a] Street tramways in the City of México generally charge 6¼ cents. Hackney coaches are divided into four classes, distinguished by tin flags painted in different colors, indicating the charge per hour for each, as follows: White flag, 50 cents per hour; red flag, $1 per hour; blue flag, $1.50 per hour. Good livery stables abound, and saddle horses may be secured at the rate of $3 for a morning's ride, or $4 for an entire afternoon. A tourist intending to take a short trip to México would do well to calculate his expenses at $10 per day, including traveling expenses.

Labor is abundant in México; in some places the supply is greater than the demand, and as the laboring classes can live on such frugal diet and need so little clothing, wages, except for imported skilled labor, are small.

[a] Mexican currency.

The *hacendados*, as the large landowners are called, own immense tracts of land, and the *hacienda*, or manor, is a congregation of buildings, forming at times quite a settlement. The *hacendado* usually works his possessions in accordance with the traditions handed down from the time of the Spanish conquest, and he is not only a landowner but he is a dealer in provisions, clothing, etc. His "peones," as the laborers and the tillers of his soil are called, are generally descended from those his father had before him, and they are paid, live, and work as their progenitors, and receive generally from 20 to 37½ cents a day.

Wages.—With respect to the rates of wages paid in the Republic, the United States Minister to México, under date of September 26, 1896,[a] reported to the Department of State that the amount of wages paid varies throughout the Republic, being higher in some sections than in others, and in certain mining districts lower than they were ten to fifteen years ago. This is generally owing to local causes. As a matter of course, owing to the construction and management of 7,000 miles of railroads, the introduction of electricity, and the placing of new and improved machinery in many of the mines and in some of the agricultural districts, there has been an increase in the number of skilled laborers, and some increase in the demand for the same, but it is true that with the great mass of the Mexican laborers there has been but little, if any, change in the amount of wages paid.

As might naturally be expected, there are some instances where laborers receive more than they did ten years ago, but these are the exceptions. There are also many instances where less is received. The daily wage paid to the farm laborer hired by the day does not exceed 30 cents, taking into account the whole laboring agricultural population. There are instances where the day laborer receives 50 cents per day; but again there are also instances where he only receives 15 to 20 cents. The Secretary of the Treasury of México estimates the daily wage of farm laborers at 25 cents.

To obtain a correct idea of the daily wages paid to the agricultural laborer it is well to divide the Republic into three districts:

First. The tropical or hot country, where labor is scarcer than on the table-lands and there is not the same necessity to work. Here, on the coffee plantations, the laborers receive from 37 to 50 cents per day.

Second. The central plateau, or table-lands, which constitute the greater portion of México as regards wealth, population, etc. Here the wages vary from 12½ to 50 cents per day, the average being from 18 to 35 cents.

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[a] United States Consular Reports, special report, "Money and Prices in Foreign Countries," Vol. XII, Part I, p. 16.

Third. The northern portion. Here labor is scarce, the influence of American customs is felt to some extent, and wages are higher than in the central portion.

A large portion of the farming in México is carried on under the "share system." The Government reports show that in many instances rations of corn are furnished to the hired laborer. In some cases we find that he is allowed a small amount per day for his board, in addition to wages; again, he is furnished by the landlord with a small piece of land to cultivate for his own benefit.

The wages of unskilled laborers in the fields, on the farms, in shops, and all other places where such labor is employed, are from 25 to 30 cents a day for men, and for women and boys from a third to a half less, the only rations ever furnished being corn and beans.

In the mines the wages of the same class of labor are from 40 to 60 and to 80 cents a day and no rations.

In the factories the wages of this same class are from 18 to 25 and 37 to 62 cents a day, without rations.

The wages of a higher class of operatives in the factories vary from 45 to 75 cents per day and no rations.

A day's labor in México is from nine to thirteen hours.

Building.—The prevailing style of architecture throughout México, so far as regards what may be termed modern buildings as contradistinguished from the ruined temples and palaces of the Republic, is the Spanish renaissance. The cathedrals and churches are all built in this style. Arabesque work and stone carvings ornament the façades of nearly all religious edifices. Governmental buildings and those devoted to public uses are generally imposing and commodious. The National Palace in México has a frontage of 675 feet and is two stories high.

Private houses are always substantially built, generally in a rectangular form around a courtyard. It is rare, except at the capital, to see a private residence over two stories high. The roofs are flat, with a wall running entirely around them. The roof is called the *azotea*, and in the warmer region is often utilized by the residents for sleeping purposes during the dry season. Growing plants and shrubs are often to be seen on the *azotea* and in the courtyard. The windows of the houses are generally barred with railings of iron. The larger residences are constructed of igneous rock, such as porous amygdaloid, porphyry, or trachyte. Dwellings are made usually of brick and *tepetate* (a kind of clay thickly sprinkled with sand and pebbles, which is soft when taken out of the deposit, but on exposure becomes exceedingly hard) and are stuccoed.

Some very fine examples of modern architecture may now be seen along the *Paseo de la Reforma* in the capital, where the wealthy class have erected several imposing residences with every comfort incident to those of more northern climes.

On the table-lands houses in the smaller towns and villages are constructed of adobe, a sun-dried brick made of dark clay mixed with straw.

The peons in the warm, well-wooded regions build of wood, palm leaves, and stalks; in the table-lands, of adobe, the houses having flat roofs of stamped clay supported by beams.

In the Indian villages the rudest possible habitations are to be seen, often being mere frameworks of limbs of trees, with the bark on, and thatched in on all sides with grass, palm leaves, or stalks. This, of course, does not apply to the City of México, which is to-day a modern city of the first class.

CHAPTER XIX.

MISCELLANEOUS STATISTICAL DATA.—WEIGHTS AND MEASURES.—CHAMBERS OF COMMERCE.—TREATIES AND CONVENTIONS.

Area of the States and Territories of México.

CENTRAL STATES.	Myriares.[a]
Federal District	1,498.75
Aguascalientes	7,692
Durango	109,495
Guanajuato	28,363
Hidalgo	22,215
México	23,185
Morelos	7,082.25
Puebla	31,616
Querétaro	11,638
San Luis Potosí	62,177
Tlaxcala	4,132
Zacatecas	63,386
NORTHERN STATES.	
Chihuahua	233,094
Coahuila	165,099
Nuevo Leon	61,343
Sonora	198,496

GULF STATES.	Myriares.
Campeche	46,855
Tabasco	26,094
Tamaulipas	83,597
Veracruz	75,863
Yucatán and Quintana Roo	91,201
STATES OF THE PACIFIC COAST.	
Lower California (Territory)	151,109
Colima	5,887
Chiapas	70,524
Guerrero	64,756
Jalisco	86,752
Michoacán	58,594
Oaxaca	91,664
Sinaloa	71,380
Tepic (Territory)	28,371
Total	1,983,159

Area of the islands.

	Myriares.		Myriares.
Guadalupe (Pacific Ocean)	208	Monserrate (Pacific Ocean)	18
Cedros (Pacific Ocean)	343	Cármen (Pacific Ocean)	134
Santa Margarita (Pacific Ocean)	171	San Márcos	24
Creciente (Pacific Ocean)	32	Partida (Pacific Ocean)	1
Revillagigedo (Pacific Ocean)	186	Cozumel (Caribbean Sea)	406
Tres Marías (Pacific Ocean)	232	Mujeres (Canal of Yucatán)	4
Tiburón (Gulf of California)	963	Espíritu Santo (Gulf of California)	96
Angel de la Guarda (Pacific Ocean)	636	Other small islands	82
Montague (Pacific Ocean)	47	Total	4,042
San Estéban (Pacific Ocean)	41	Total area of the States and Territories	1,983,159
San Lorenzo (Pacific Ocean)	49	Total area of the islands	4,042
San José (Pacific Ocean)	190	Grand total	1,987,201
Cerralvo (Pacific Ocean)	113		
Santa Catalina (Pacific Ocean)	66		

[a] One myriare is equal to 1,000,000 square meters, or 1,196,000 square yards, or 247,105 acres.

Position and altitude of the capitals of the States.

State.	Capital.	Latitude.			Longitude.			Authority.	Altitude.	Authority.
		°	′	″	°	′	″		*Meters.*	
Durango	Durango	24	01	28.7	5	31	55.1 W.	L. Fernández	2,100	Meteorological Observatory.
Zacatecas	Zacatecas	22	46	34.6	3	26	21.6 W.	.....do	2,442	Central Railroad.
San Luis Potosí	San Luis Potosí (cross on top of the tower of the cathedral).	22	09	07.7	1	50	30.5 W.	Comisión Geográfico-Exploradora	1,890	Meterological Observatory.
Aguas Calientes	Aguascalientes	21	53	01.0	3	09	56.4 W.	A. Anguiano	1,861	Do.
Guanajuato	Guanajuato	21	00	57.7	2	07	07 8 W.	.....do	2,083	Do.
Querétaro	Querétaro	20	35	41.6	1	15	20.0 W.	.....do	1,490	Do.
Hidalgo	Pachuca	20	07	35.0	0	23	19.2 E.	Landero y L. Fernández	2,450	Do.
México	Toluca	19	17	27.7	0	32	47.4 W.	Jiménez y A. Díaz	2,625	Do.
Federal District	México	19	26	05.0				.....do	2,260	Do.
Tlaxcala	Tlaxcala	19	19	04.0	0	53	45.0 E.	Comisión Geográfico-Exploradora	2,252	Comisión Geográfico-Exploradora.
Morelos	Cuernavaca	18	55	02.3	0	06	42.0 W.	F. Jiménez	1,542	Do.
Puebla	Puebla	19	02	30.5	0	56	06.0 E.	Comisión Geográfico-Exploradora	2,162	Do.
Sonora	Hermosillo (cross on tower of the cathedral).	29	04	28.0	11	49	48.8 W.	.....do	210	Sonora Railroad.
Chihuahua	Chihuahua	28	38	23.2	6	56	22.8 W.	F. Valle y L. Fernández	1,412	Central Railroad.
Coahuila	Saltillo	25	25	26.0	1	48	24.0 W.	F. Valle y F. Landero	1,627	Meteorological Observatory.
Nuevo Leon	Monterey	25	40	14.9	1	10	07.0 W.	Landero	495	Do.
Tamaulipas	Ciudad Victoria	23	42	54.0	0	01	02.0 E.	Canseco y L. Fernández	449	Do.
Veracruz	Xalapa	19	31	38.0	2	13	12.5 E.	Comisión Geográfico-Exploradora	1,405	Comisión Geográfico-Exploradora.
Tabasco	S. Juan Bautista	17	59	50.0	6	12	47.8 E.	Guatemala Boundary Commission	(a)	Guatemala Boundary Commission.
Campeche	Campeche (approximate).	19	49	50.0	8	33	30.0 E.		(b)	
Yucatán	Mérida (approximate)	20	55	40.0	9	24	30.0 E.		8	Progreso and Mérida Railroad.
Lower California (Territory)	La Paz	24	10	10.0	11	13	56.0 W.	American Chart Narragansett	(b)	
Sinaloa	Culiacán	24	48	03.6	8	18	30.8 W.	F. Quijano (deducted)	40	Altata and Culiacán Railroad.
Tepic Territory	Tepic	21	30	47.2	5	46	14.7 W.	Landero	953	Meteorological Observatory.
Jalisco	Guadalajara	20	40	45.5	4	12	31.4 W.	A. Anguiano	1,566	Do.
Colima	Colima	19	14	21.0	4	35	47.0 W.	Landero	486	
Michoacán	Morelia	19	42	13.1	2	08	29.3 W.	L. Fernández	1,950	Do.
Guerrero	Chilpancingo	17	33	10.0	0	22	02.7 W.	Jacobo Blanco	1,193	Almazán.
Oaxaca	Oaxaca	17	03	28.0	2	25	20.7 E.	Pastrana	1,546	Meteorological Observatory.
Chiapas	Tuxtla Gutiérrez	16	45	20.0	6	00	50.0 E.	Guatemala Boundary Commission	530	Sapper.

a 27.20 meters, cemetery; 14.20 meters, shore.

b Near the sea level.

Altitude of some mounts, valleys, and notable railway stations.

State.	Name.	Class.	Altitude.	Authority.
			Meters.	
Veracruz	Pico de Orizaba (Citlaltepec).	Volcano	5,700	Comisión Geográfico-Exploradora.
México and Puebla	Popocatepetl	do	5,452	Do.
México	Ixtaccihuatl (highest point).	do	5,286	Do.
Do	Ixtaccihuatl (top rock)	do	5,146	Do.
Do	Ixtaccihuatl (foot rock)	do	4,740	Do.
Puebla and Tlaxcala.	Malinche	do	4,461	Do.
México	Nevado de Toluca	do	4,623	Humboldt.
Veracruz	Cofre de Perote (Nauhcampantepetl).	do	4,281	Comisión Geográfico-Exploradora.
Federal District	Ajusco	Mount	3,986	Do.
Jalisco	Volcán de Colima	Volcano	3,960.09	Matute y Bárcena.
Puebla	Las Derrumbadas	Mount	3,598.09	Almazán.
Do	Ocelotzin	do	3,500.06	Do.
Oaxaca	Cempoaltepec (summit)	do	3,396	Harcort.
México	Sumate	do	3,352.07	Report of Pedro G. Conde.
Puebla	Pinal	do	3,316	Comisión Geográfico-Exploradora.
Hidalgo	Jacal ó Navajas (near Real del Monte).	do	3,137.05	Burkart.
Puebla	Chichintepec	do	3,072	Almazán.
México	Tarimangacho (near Tlalpujahua).	do	3,068.04	Burkart.
Oaxaca	Cumbre de los Ocotes	do	3,056	Harcort.
Tepic	Ceboruco	Volcano	2,164	Matute, Iglesias y Bárcena.
Zacatecas	Bufa	Mount	1,383	Bustamente.
Michoacán	Jorullo	Volcano	1,300	Humboldt.
Tlaxcala	Llanos de Apam	Plain	2,480	Data collected by Sr Ferrari.
Puebla	San Juan de los Llanos	do	2,360	Do.
Hidalgo	Llanos del Cazadero	do	2,300	Do.
San Luis Potosí	Llanos de "El Salado"	do	2,000–2,300	Do.
Michoacán	Pátzcuaro	Valley	2,000–2,150	Do.
Hidalgo	Tula	do	2,047	Do.
Guanajuato	El Bajío	do	1,750–1,790	Do.
Durango	Cuencamé	do	1,740	Do.
Veracruz	Valle de Maltrata	do	1,691	Do.
Do	Valle de Orizaba	do	1,227	Do.
San Luis Potosí	Valle del Maiz	do	1,220	Do.
Tamaulipas	Tula	do	1,171	Do.
Durango	Vegas de Nazas	do	1,100	Do.
Guerrero	Iguala	do	919	Do.
Michoacán	Jorullo	do	850	Do.
Jalisco	Acaponeta	do	64	Do.
Federal District	La Cima	Railway station on the Cuernavaca and Acapulco R. R.	3,040	Data from the Ministerio de Comunicaciones.
México	Salazar	Railway station on the Compañía Nacional Mexicana.	3,000	Do.
Veracruz	Las Vigas	Railway station on the Veracruz and Jalapa.	2,421.10	Do.
Do	Boca del Monte	Railway station on the Nacional Mexicano.	2,415.36	Do.
Puebla	Amozoc	Railroad station	2,320	Do.

General synopsis of the meteorological observations taken in several places of the Republic during the year 1902.

Place.	Barometer.			Temperature in the shade.[a]			Largest monthly rainfall.
	Mean annual.	Maximum absolute.	Minimum absolute.	Maximum absolute.	Minimum absolute.	Mean annual.	
	Mm.	*Mm.*	*Mm.*	°	°	°	
Colima	721.7	729.9	713.3	36.5	11.0	24.4	July.
Chihuahua	641.0	648.6	632.4	37.0	− 3.0	18.5	July and Aug.
Guadalajara	633.4	634.0	628.7	34.7	5.0	20.0	July.
Guanajuato	601.6	607.0	595.3	34.5	1.0	18.5	Do.
León (Guanajuato)	617.1	622.0	610.3	34.5	− 0.9	18.6	Do.
Mazatlán	759.5	765.5	762.1	33.3	13.8	24.7	Do.
Mérida	760.1	768.8	751.5	40.8	8.9	25.4	October.
México	585.5	590.1	578.6	30.6	0.5	15.9	July.
Monterrey	715.3	727.9	701.8	38.5	1.2	22.7	September.
Morelia	608.5	612.9	602.8	31.9	− 1.0	16.5	July.
Pachuca	572.6	577.0	566.4	23.4	7.0	16.9	September.
Puebla	592.1	596.3	587.3	28.6	− 1.4	15.5	July.
Querétaro	613.6	618.1	607.2	34.8	0.6	18.3	Do.
Zacatecas	571.4	576.5	565.0	30.6	− 2.0	15.0	September.

Place.	Percentage of humidity.	Clouds.		Winds.			Rainfall.			Average evaporation.	
		Mean annual quantity.	Predominant direction.	Predominant direction.	Maximum velocity.	Mean velocity.	Rainy days.	Total rainfall.	Maximum altitude in 24 hours.	In the sun.	In the shade.
Colima	66	4.7	.....	NE. and S.	8.2	1.5	85	679.4	44.3	.....	.....
Chihuahua	46	5.0	.....	NE.	16.0	.....	74	467.5	43.0	.....	.....
Guadalajara	55	5.8	.....	S.	.....	.....	94	804.3	58.0	.....	.....
Guanajuato	50	2.8	.....	ENE.	8.1	.....	63	.....	59.8	.....	.....
León (Guanajuato)	60	5.2	.....	NW.	16.4	1.3	104	572.7	55.0	.....	.....
Mazatlán	74	3.4	W.	NW.	18.0	1.9	70	413.1	39.5	6.7	2.7
Mérida	70	5.3	.....	NE.	7.9	1.0	69	819.7	90.0	.....	.....
México	55	5.3	NE.	NE.	12.4	0.7	131	451.4	42.2	6.2	2.6
Monterrey	64	4.6	SE.	SE.	12.5	.....	97	397.3	48.0	.....	.....
Morelia	62	4.9	SW.	S. and SW.	12.0	2.9	77	574.7	44.0	.....	8.9
Pachuca	69	3.3	.....	NE.	7.3	.....	69	1,247.6	295.0	.....	.....
Puebla	64	4.3	E.	E.	14.6	1.7	110	915.3	74.6	.....	5.0
Querétaro	54	3.0	.....	E.	43.4	2.3	79	587.1	54.0	.....	.....
Zacatecas	55	3.7	.....	E.	12.5	2.6	86	481.1	28.7	.....	.....

[a] Centigrade.

Vital statistics for the year 1901, and population in 1900.

State.	Births.[a]				
	Male.	Female.	Total.	Legitimate.	Illegitimate.
Aguascalientes	4,731	4,462	9,193	7,503	1,690
Campeche	1,657	1,565	3,222	2,423	799
Coahuila	4,110	3,731	7,841	7,021	820
Colima	1,086	873	1,909	1,130	779
Chiapas	6,185	5,737	11,922	3,133	8,789
Chihuahua	5,326	5,113	10,439	.....	.....
Federal District	8,371	7,890	16,261	6,223	10,038
Durango	5,373	5,022	10,395	7,080	3,315
Guanajuato	12,078	11,319	23,397	11,594	11,803
Guerrero	9,489	8,840	18,329	.....	.....
Hidalgo	9,135	8,254	17,389	6,388	11,001
Jalisco	25,956	24,467	50,423	44,821	5,602
México	14,251	12,834	27,085	18,028	9,057
Michoacán	24,690	22,160	46,850	.....	.....
Morelos	3,305	3,096	6,401	2,952	3,449
Nuevo León	7,106	6,455	13,561	12,183	1,378
Oaxaca	19,385	18,052	37,437	13,055	24,382

[a] Birth rate, 34.54 per 1,000 inhabitants.

Vital statistics for the year 1901, and population in 1900—Continued.

State.	Births.				
	Male.	Female.	Total.	Legitimate.	Illegitimate.
Puebla	12,869	11,934	24,803	13,449	11,354
Querétaro	1,903	1,691	3,594	2,887	707
San Luis Potosí	11,077	10,220	21,297	15,932	5,365
Sinaloa	4,275	4,023	8,298	2,422	5,876
Sonora	2,328	2,026	4,354	2,264	2,090
Tabasco	3,618	3,390	7,008	3,592	3,416
Tamaulipas	2,842	2,457	5,299	3,634	1,665
Tlaxcala	3,150	3,038	6,188	4,876	1,312
Veracruz	14,453	13,185	27,638	11,306	16,332
Yucatán	8,260	7,759	16,019	13,166	2,853
Zacatecas	10,503	9,870	20,373	17,208	3,165
Tepic	6,180	5,751	11,931	3,980	7,951
Lower California	617	587	1,204	618	586
Total	244,259	225,801	470,060	238,868	155,574

State.	Deaths.[a]					Population, census 1900.
	Mexicans.	Foreign.	Male.	Female.	Total.	
Aguascalientes	4,363	7	2,263	2,107	4,370	102,416
Lower California	1,210	16	681	545	1,226	47,624
Campeche	2,617	25	1,288	1,354	2,642	86,542
Coahuila	7,369	33	3,831	3,571	7,402	296,938
Colima	2,590	5	1,473	1,122	2,595	65,115
Chiapas	8,766	.....	4,617	4,149	8,766	360,799
Chihuahua	.....	.....	3,398	3,139	6,537	327,784
Durango	10,491	31	5,491	5,031	10,522	370,294
Federal District	28,985	300	15,265	14,020	29,285	541,516
Guanajuato	35,994	6	18,269	17,731	36,000	1,061,724
Guerrero	.....	.....	8,439	7,982	16,421	479,205
Hidalgo	19,868	17	10,264	9,621	19,885	605,051
Jalisco	39,151	24	20,059	19,116	39,175	1,158,891
México	30,716	19	16,012	14,723	30,735	934,463
Michoacán	.....	.....	14,116	13,350	27,466	930,033
Morelos	6,897	10	3,615	3,292	6,907	160,115
Nuevo León	8,875	37	4,528	4,384	8,912	327,937
Oaxaca	31,582	20	16,828	14,774	31,602	948,633
Puebla	36,512	30	18,877	17,665	36,542	1,021,133
Querétaro	7,510	2	3,757	3,755	7,512	232,389
San Luis Potosí	17,088	59	8,690	8,457	17,147	575,432
Sinaloa	7,375	21	3,869	3,527	7,396	296,701
Sonora	4,447	82	2,446	2,083	4,529	221,682
Tabasco	5,723	40	2,965	2,798	5,763	159,834
Tamaulipas	4,891	34	2,540	2,385	4,925	218,948
Tlaxcala	5,461	.....	2,837	2,624	5,461	172,315
Veracruz	26,552	204	14,279	12,477	26,756	981,080
Yucatán	17,892	91	9,820	8,163	17,983	314,087
Zacatecas	14,198	7	7,272	6,933	14,205	462,190
Tepic	6,225	8	3,272	2,961	6,233	150,098
Total	393,348	1,128	231,061	213,839	444,900	13,605,919

[a] Death rate, 32.29 per 1,000 inhabitants.

Estimated value of the city and suburban property in México on December 31, 1902.

[Values in Mexican silver.]

State.	Suburban.	City.	Total.
Aguascalientes	$3,610,961.77	$3,549,000.00	$7,159,961.77
Campeche	4,792,691.00	6,874,280.00	11,666,971.00
Coahuila	9,414,136.00	5,562,305.00	14,976,441.00
Colima	2,810,400.00	1,440,975.00	4,251,375.00
Chiapas	23,272,129.00	3,875,588.00	27,147,717.00
Chihuahua	6,489,572.67	6,043,420.16	12,532,992.83
Durango	15,925,915.00	6,219,090.00	22,145,005.00
Federal district	33,529,293.17	168,427,976.44	201,957,269.61
Guanajuato	33,156,940.08	11,804,648.12	44,961,588.20
Guerrero	2,701,935.00	1,280,234.00	3,982,169.00
Hidalgo	18,526,773.33	8,690,264.43	27,217,037.76
Jalisco	51,853,222.00	37,779,948.00	89,633,170.00
Lower California, northern district	963,472.66	215,407.00	1,178,879.66
Lower California, southern district	2,708,038.72	1,034,421.40	3,742,460.12
México	26,438,635.96	11,794,433.07	38,233,069.03
Michoacán	25,091,195.00	9,670,309.00	34,761,504.00
Morelos	7,279,023.34	1,904,076.89	9,183,100.23
Nuevo León	7,186,045.13	8,292,280.32	15,478,325.45
Oaxaca	13,114,107.51	8,599,457.86	21,713,565.37
Puebla	33,662,880.04	23,110,466.09	56,773,346.13
Querétaro	10,153,075.00	4,358,080.00	14,511,155.00
San Luis Potosí	14,947,545.00	10,839,259.00	25,786,804.00
Sinaloa	6,448,758.20	4,956,891.25	11,405,649.45
Sonora	5,743,457.85	5,458,272.07	11,201,729.92
Tabasco	8,263,007.16	5,554,172.69	13,817,179.85
Tamaulipas	6,444,953.21	5,937,931.23	12,382,884.44
Territory of Tepic	3,741,528.00	2,797,664.24	6,539,192.24
Tlaxcala	8,058,405.05	373,535.08	8,431,940.13
Veracruz	53,936,180.72	38,618,550.10	92,554,730.82
Yucatán	15,090,125.54	14,044,878.59	29,135,004.13
Zacatecas	15,632,451.82	9,431,172.64	25,063,623.96
Total	470,986,854.43	428,538,987.67	899,525,842.10

Revenues and expenditures of the States in 1900, 1901, and 1902.

[Values in Mexican silver.]

REVENUES.

State.	1900.	1901.	1902.	Total.
Aguascalientes	$124,618.59	$127,055.00	$172,213.35	$1,239,132.01
Campeche	315,985.62	348,674.40	294,577.17	3,279,761.02
Coahuila	485,485.37	446,743.80	515,330.15	4,079,342.82
Colima	141,918.49	125,259.81	164,756.24	1,392,047.50
Chiapas	521,235.67	492,022.77	395,713.48	4,668,333.86
Chihuahua	1,100,807.03	.....	.....	6,100,043.76
Durango	1,063,531.26	1,754,669.81	879,423.05	9,675,974.90
Guanajuato	1,300,910.80	1,150,462.71	1,134,078.13	12,738,116.16
Guerrero	440,411.74	489,014.48	447,681.84	4,023,213.08
Hidalgo	1,083,679.22	1,149,685.70	1,230,677.55	13,941,102.08
Jalisco	1,444,546.77	1,810,059.29	1,814,807.93	14,397,872.23
México	1,120,946.83	1,511,856.14	1,121,931.88	10,666,180.95
Michoacán	963,351.70	1,002,951.81	992,508.46	10,498,172.12
Morelos	399,238.98	372,905.19	365,762.24	3,908,891.79
Nuevo León	369,609.74	278,977.32	340,449.12	2,479,556.97
Oaxaca	950,236.22	909,296.36	981,066.03	9,167,493.41
Puebla	1,229,949.46	1,255,810.26	1,285,290.87	11,721,849.90
Querétaro	352,382.49	346,539.72	409,725.72	3,387,825.29
San Luis Potosí	961,882.22	938,643.60	928,734.37	9,887,007.26
Sinaloa	468,882.41	503,971.16	502,298.14	5,100,398.57
Sonora	581,104.34	605,986.60	664,831.04	5,879,880.14
Tabasco	414,473.06	431,505.45	533,216.58	3,800,010.99
Tamaulipas	304,324.45	247,742.97	399,114.85	2,814,947.93
Tlaxcala	243,817.41	231,047.80	294,112.12	2,105,446.79
Veracruz	965,891.47	1,061,111.61	.....	8,645,514.09
Yucatán	1,508,821.64	858,897.93	1,460,017.82	9,352,062.38
Zacatecas	1,411,489.98	1,526,832.56	758,635.26	11,172,910.76
Total	20,289,532.96	19,977,724.25	18,086,962.39	185,623,083.74
Federal Treasury	64,675,098.45	63,283,196.17	66,774,380.15	538,798,257.49
Grand total	84,964,631.41	83,260,920.42	84,861,332.54	724,421,291.23

Revenues and expenditures of the State in 1900, 1901, and 1902—Continued.

EXPENDITURES.

State.	1900.	1901.	1902.	Total,
Aguascalientes	$119,209.91	$125,627.71	$169,196.94	$1,228,667.68
Campeche	271,736.00	302,252.84	337,013.09	3,106,973.82
Coahuila	465,372.10	433,927.66	503,707.24	3,853,862.06
Colima	141,837.09	122,837.64	157,859.54	1,355,519.10
Chiapas	499,763.57	582,179.09	398,668.51	4,616,217.93
Chihuahua	1,182,559.18	.....	.....	5,940,196.54
Durango	1,054,113.44	1,754,305.58	541,382.24	9,285,973.30
Guanajuato	1,386,758.99	1,269,257.13	1,146,668.12	13,581,261.10
Guerrero	434,224.01	460,987.11	423,230.22	3,747,248.57
Hidalgo	1,034,697.55	1,096,181.88	1,222,483.90	13,626,928.84
Jalisco	1,515,561.00	1,799,597.45	1,875,231.16	14,636,651.97
México	1,143,505.84	1,066,877.53	1,123,289.20	9,800,189.08
Michoacán	962,645.47	919,162.34	959,032.54	10,067,730.24
Morelos	384,013.73	363,497.12	366,229.14	3,842,552.64
Nuevo León	358,013.11	265,173.47	371,727.87	2,339,606.59
Oaxaca	886,919.80	896,006.31	891,263.32	8,848,647.14
Puebla	1,479,933.09	1,196,337.38	1,227,450.64	11,468,703.78
Querétaro	340,108.71	344,362.11	402,867.95	3,352,661.45
San Luis Potosí	934,776.81	817,546.13	919,347.19	8,959,481.86
Sinaloa	473,153.85	493,227.80	512,201.13	5,006,721.74
Sonora	638,016.87	500,613.53	496,705.45	5,742,607.56
Tabasco	413,559.46	406,112.01	523,331.70	3,747,748.78
Tamaulipas	294,189.60	247,424.90	384,976.76	2,198,993.72
Tlaxcala	247,030.84	230,905.76	255,668.94	2,074,895.00
Veracruz	1,119,659.92	1,089,527.28	.....	8,581,337.66
Yucatán	1,507,944.21	1,018,308.80	1,826,183.65	9,305,328.59
Zacatecas	1,405,761.79	1,525,309.68	791,991.19	11,153,301.48
Total	20,645,065.94	19,231,546.24	17,322,707.63	181,965,008.12
Federal Treasury	57,944,687.85	59,423,005.75	63,081,513.73	518,979,935.49
Grand total	78,589,753.79	78,654,551.99	80,404,221.36	700,944,943.61

WEIGHTS AND MEASURES.

The metric system is in official use in the Republic of México, having been adopted by the Government in the year 1862. It is used to compute all customs and other duties to be paid to the General Government, in the measurement of public lands, and by the railroads in all freight and other transactions, and is exclusively taught in the public schools. The old-time weights and measures were founded on Spanish models, but, owing to the inexactness of the first standards and to subsequent changes, differ at present very widely from their originals. The value of the metric system here assigned to each denomination of the old weights and measures is that fixed by the Mexican Government at the time of the adoption of the metric system. These tables are from the first edition of the Handbook of México, published by the Bureau of the American Republics in 1891. They are reproduced here because the nomenclature of the old system is still in use in publications on México. By law of June 19, 1895, the metric system was declared the only legal system of weights and measures in the country, and became compulsory throughout the Republic on September 16, 1896. The equivalents in American weights and measures were calculated from data found in Trautwine's Pocket Book as to the comparison between French and American weights and measures, and are believed to be correct.

LINEAR MEASURES.

1 legua (league) =5,000 varas =4.19 kilometers =2.604375 miles.
1 vara (yard) =3 piés =0.83800 meter =2.749578 feet.
1 pié (foot) =12 pulgadas =0.27933 meter =0.916526 foot.
1 pulgada (inch) =12 lineas =0.02328 meter =0.916526 inch.
1 linea (line) =0.00194 meter =0.076377 inch.

The vara is also divided (for dry-goods selling) into palmos or cuartas.

1 palmo or cuarta =0.209500 meter =0.687394 foot =8.248728 inches.

SUPERFICIAL OR SQUARE MEASURE.

1 square legua =1,755.61 hectares = 4,339.4 acres.
1 square vara =0.702244 square meter = 7.559000 square feet.
1 square pié =0.078027 square meter = 0.839888 square foot.
1 square palmo =0.043890 square meter =68.03094 square inches.
1 square pulgada =0.000542 square meter = 0.84012 square inch.

Land or agrarian measures.

Spanish name.	Nearest English equivalent.	Length (varas).	Breadth (varas).	Hectares.	Acres.
Hacienda	Plantation	25,000	5,000	8,778.0500000	21,697.000
Sitio de ganado mayor	Cow ranch	5,000	5,000	1,755.6100000	4,339.400
Sitio de ganado menor	Sheep ranch	3,333⅓	3,333⅓	780.2711111	1,928.133
Fundo legal para pueblo	Legal town site	1,200	1,200	101.1231360	244.140
Labor	Field	1,000	1,000	70.2244000	175.582
Caballeria de tierra	Knighthold of land	1,104	552	42.7968111	105.751
Fanega sembradura de maiz	Sowing ground for 1 fanega of corn.	276	184	3.5662759	8.813
Solar para casa, molino, ó venta.	Site for a house, mill, or inn.	50	50	.1755610	.434

HYDROMETRIC MEASURE.

This was used for measuring and distributing water for irrigation and domestic uses:

1 *buey* (ox) ..... =48 *surcos*.
1 *surco* (furrow) ..... = 3 *naranjas*.
1 *naranja* (orange) ..... = 8 *reales* or *limones*.
1 *real* (bit) or *limón* (lemon) ..... = 2 *dedos*.
1 *dedo* (finger) ..... = 9 *pajas* (straws).

According to the old ordinances of lands and waters established in Spanish times, the *buey* of water was as much as would flow through an aperture 1 *vara* (0.838 meter) square, no head or pressure being mentioned. By a law of the Mexican Republic, of August 2, 1863, 1 *surco* was made equal to 6½ liters per second for rural measures, and the *paja* was made equal to 0.45 liters per minute for town measurements. This distinction was intended to make the *surco* a unit for irrigation, while the *paja* was made the unit for distributing water to houses, etc., in towns.

CUBIC MEASURES.

	Cubic meter.	Cubic yard.
1 cubic *vara*	= 0.588480	= 0.769734
1 cubic *pie*	= 0.021795	= 0.769484
1 cubic *palmo*	= 0.009195	= 0.324634

DRY MEASURES.

	Liters.	Bushels.
1 *carga*=2 fanegas	=181.629775	= 5.154357
1 *fanega*=12 almudes	= 90.814888	= 2.577178
		Pecks.
1 *almud*=4 cuartillos	= 7.567907	= 0.859109
		Dry quarts.
1 *cuartillo* (quart)	= 1.891977	= 1.718122

OIL MEASURE.

	Liter.	U. S. liquid quart.
1 *cuartillo*	= 0.506162	= 0.534870

WINE MEASURE.

	Liter.	U. S. liquid quart.
1 *cuartillo*	= 0.456264	= 0.482140

COMMERCIAL WEIGHTS.

	Kilogrammes.	U. S. pounds avoirdupois.
1 *quintal*=4 *arrobas*	= 46.024634	=101.444
1 *arroba*=25 *libras*	= 11.506159	= 25.361
1 *libra* (pound)=16 *onzas*	= 0.460246	= 1.01444
		Ounces avoirdupois.
1 *onza* (ounce)=16 *adarmes*	= 0.028765	= 1.0148
1 *adarme* (dram)=36 *granos*	= 0.001798	= 0.06343
		Grains.
1 *grano* (grain)	= 0.0000499	= 0.77160

In commerce there was used the following relation between the kilogramme and the pound (*libra*) different from the ratio as fixed by Government, viz:

1 kilogramme ..... =2.1733 pounds (*libras*)

There is also a weight called *carga*, used in commerce, in freighting, and in mining:

1 *carga*=12 *arrobas*=300 pounds ..... =138.073902 kilogrammes=304.332 United States pounds avoirdupois.

PRECIOUS METAL WEIGHTS.

	Kilogramme.	Ounces avoirdupois.
1 *marco*=8 *onzas*	=0.230123	=8.1184
1 *onza*=8 *ochavas*	=0.028765	=1.0148
1 *ochava* (eighth)=6 *tomines*	=0.003596	=0.12685
		Grains.
1 *tomin*=12 *granos*	=0.000599	=9.25920
1 *grano*	=0.0000499	=0.77160

The following table shows the coins issued by the Mexican mints:

Denomination.	Fineness.	Value in pesos.	Weight in—		Diameter in—	
			Grams.	Troy ounces.	Millimeters.	Inches.
Gold coins:[a]						
Double hidalgo	875	20.00	33.841	1.0860	34	1.33858
Hidalgo	875	10.00	16.920	.5430	27	1.06299
Medio hidalgo	875	5.00	8.460	.2715	22	.86614
Cuarto hidalgo	875	2.50	4.230	.13575	18	.70866
Décimo hidalgo	875	1.00	1.692	.05430	15	.59055
Silver coins:[a]						
Peso	902	1.00	27.073	.866	37	1.45669
50 centavos	902	.50	13.536	.433	30	1.18110
25 centavos	902	.25	6.768	.2165	25	.98425
10 centavos	902	.10	2.707	.0866	17	.66929

[a] There were formerly coined in gold the onza=$16 in silver; the media onza=$8; the pistola=$4; the escudo de oro=$2; and the escudito de oro=$1. In silver, the real=$0.12½; medio real=$0.06¼.

CHAMBERS OF COMMERCE.

Chambers of commerce in the United Mexican States at the beginning of the year 1902, as given in the Anuario Estadístico for 1902:

City.	State.
Aguascalientes	Aguascalientes.
Saltillo	Coahuila.
Porfirio Diaz	Do.
Colima	Colima.
Comitán	Chiapas.
Acapulco	Guerrero
Guadalajara	Jalisco.
Ameca	Do.
Puebla	Puebla.
Querétaro	Querétaro
Culiacán	Sinaloa.
Mazatlán	Do.
Hermosillo	Sonora.
Ciudad Victoria	Tamaulipas.
Tampico	Do.
Veracruz	Veracruz.
México	Distrito Federal.
Do	Do.
Do	Do.

First monetary census of 1903.

State.	Specie held in public offices.				Specie held by the banks.				Specie held in business houses, factories, plantations, etc.				Specie held by private individuals.				Total.	Population.
		Silver.				Silver				Silver.				Silver.				
	Gold.	Pesos.	Subsidiary coins.	Copper coins.	Gold.	Pesos.	Subsidiary coins.	Copper coins.	Gold.	Pesos.	Subsidiary coins.	Copper coins.	Gold.	Pesos.	Subsidiary coins.	Copper coins.		
Aguascalientes	$2	$5,108	$414.50	$14.68	.....	$265,284	$146.35	$0.56	$373	$49,622	$4,689.90	$177.62	$50	$517	$120.00	$1.50	$326,521.11	102,416
Lower California	181	65,254	669.90	33.64	.....	500	15.00	.60	2,801	247,264	16,463.75	362.36	.....	6,864	63.00	12.38	340,484.63	47,624
Campeche	260	14,466	6,111.55	37.60	.....	10,433	3,342.50	.12	361	41,993	6,442.05	147.11	1,472	5,330	3,760.85	303.50	94,460.28	86,542
Chiapas	2,101	63,580	44,795.15	350.53	.....	101,455	15,442.40	.17	5,105	109,221	92,714.70	268.39	109	8,706	8,916.00	5.06	452,770.40	360,799
Chihuahua	36	47,177	3,034.90	129.14	$5,882	1,647,982	14,659.50	284.11	17,245	237,966	24,014.75	2,531.39	1,096	28,132	2,222.25	148.96	2,032,541.00	327,784
Coahuila	65	70,170	7,093.90	204.65	.....	882,541	1,827.85	36.31	7,553	295,017	19,522.65	1,130.36	211	8,088	732.15	31.78	1,294,224.85	296,938
Colima	.....	9,566	905.15	333.18	.....	113,408	6,131.75	.36	45	22,682	424.30	27.28	.....	.....	.....	.....	153,523.02	65,115
Federal District	288	294,251	23,364.35	1,131.64	84,782	16,791,945	6,411.85	1,584.69	30,592	1,034,900	106,551.15	5,372.31	5,649	61,941	12,116.30	1,146.36	18,462,026.55	541,516
Durango	247	60,487	3,447.80	220.38	1,495	1,228,464	1,960.70	31.59	2,153	133,933	20,349.40	569.98	2,219	69,184	3,856.95	94.12	1,528,712.92	370,294
Guanajuato	224	178,658	9,041.90	664.74	9,370	1,267,790	4,191.00	5.56	5,132	323,345	20,606.90	2,102.43	2,701	69,527	6,748.80	38.11	1,900,146.44	1,061,724
Guerrero	.....	107,435	19,829.75	831.14	.....	.....	.....	.....	1,918	73,659	2,154.10	62.87	.....	.....	.....	.....	205,889.86	479,205
Hidalgo	684	102,191	19,246.10	2,637.06	.....	352,126	1,348.10	.....	220	61,473	14,146.05	465.04	7	6,984	753.75	57.09	562,388.19	605,051
Jalisco	18	111,727	21,818.60	2,484.49	2,623	1,855,229	122,825.85	8.67	6,861	187,687	33,786.45	3,440.92	20	2,776	70.40	10.25	2,351,386.63	1,153,891
México	120	103,489	27,305.70	875.55	88	724,635	2,641.45	.....	2,140	194,002	34,509.90	2,780.26	124	5,833	1,817.55	320.25	1,100,681.66	934,463
Michoacán	47	69,002	13,458.55	955.65	41	599,124	10,561.55	70.79	3,002	244,797	20,506.20	1,512.13	4,779	64,304	7,000.55	555.66	1,039,717.08	930,053
Morelos	2	62,682	5,485.05	277.54	.....	205,703	800.00	.....	10	40,082	8,692.60	456.79	166	10,436	740.80	108.19	335,641.97	160,115
Nuevo León	65	53,794	3,864.75	171.23	157	2,301,351	32,383.95	109.48	19,540	229,580	18,625.15	1,056.96	6,348	160,912	3,970.05	344.47	2,832,273.04	327,937
Oaxaca	20	61,102	16,229.10	352.04	3,720	487,919	22,127.25	.09	12,303	185,226	30,032.90	1,420.09	386	7,274	1,154.30	137.35	829,403.12	948,633
Puebla	5	136,579	45,913.80	2,355.82	.....	2,636,791	21,414.15	5.58	7,461	271,505	71,684.80	1,745.46	773	26,608	7,092.40	52.88	3,229,986.89	1,021,133
Querétaro	.....	31,525	4,977.65	342.99	.....	.....	.....	.....	226	40,429	3,815.50	313.90	340	13,589	939.70	33.74	96,532.48	232,389
Quintana Roo	.....	64,041	844.05	10.76	.....	.....	.....	.....	318	11,951	223.60	.83	.....	440	9.70	.21	77,839.15	3,141
San Luis Potosí	224	38,294	4,456.85	484.38	2,545	1,728,558	42,985.15	2.74	4,539	420,453	14,320.30	1,007.16	.....	1,588	144.65	31.55	2,259,633.78	575,432
Sinaloa	716	157,297	3,693.20	2,263.00	23,188	1,280,301	92,336.05	92.46	42,575	301,214	20,437.45	1,436.46	11,472	27,064	2,080.25	111.81	1,966,277.68	296,701
Sonora	321	121,585	3,271.35	82.99	33,564	1,429,680	13,463.75	.96	3,487	191,231	18,000.55	115.47	11,993	21,676	939.85	4.37	1,849,416.29	221,682
Tabasco	80	32,222	22,819.85	65.56	1,116	431,984	257,720.50	9.82	3,282	64,443	38,356.10	460.25	127	3,938	3,836.35	11.05	860,471.48	159,834
Tamaulipas	.....	29,385	2,057.55	88.40	80	762,012	128,611.80	10.70	6,209	215,424	15,091.00	666.06	356	16,484	830.05	27.46	1,177,333.02	218,948
Tepic	.....	45,533	2,391.80	151.95	300	124,000	6,900.00	2.15	629	49,774	5,035.25	220.88	28	2,001	54.65	8.40	237,030.08	150,098
Tlaxcala	.....	4,425	2,312.55	29.48	.....	.....	.....	.....	67	12,248	4,937.90	111.41	.....	.....	.....	.....	24,131.34	172,315
Veracruz	138	81,722	13,530.75	407.35	222	2,434,720	571,335.10	120.45	37,003	676,706	87,316.10	2,995.09	688	11,507	3,010.90	90.71	3,921,512.45	931,030
Yucatán	62	141,115	17,884.30	342.67	1,044	7,820,756	248,947.10	3.56	20,056	420,325	93,382.60	2,961.77	1,747	27,388	5,221.20	34.12	8,801,270.32	310,946
Zacatecas	23	79,931	4,217.30	329.16	3,295	811,033	46,752.45	47.07	7,372	319,765	14,005.45	839.65	5	28,596	996.90	72.55	1,317,280.53	462,190
Total	5,929	2,443,793	354,487.70	18,709.29	173,512	48,295,726	1,677,283.10	2,428.59	250,578	6,707,917	860,839.50	36,758.88	52,866	697,686	79,200.30	3,793.88	61,661,508.24	13,604,943

TREATIES AND CONVENTIONS.

ARGENTINE REPUBLIC.

Treaty of compulsory arbitration, January 29, 1902.

BELGIUM.

Convention for the extradition of criminals, May 12, 1881.
Treaty of amity, commerce, and navigation, June 7, 1895.

BOLIVIA.

Treaty of compulsory arbitration, January 29, 1902.

CHINA.

Treaty of amity, commerce, and navigation, December 14, 1899.

DOMINICAN REPUBLIC.

Treaty of amity, commerce, and navigation, March 29, 1890.
Treaty of compulsory arbitration, January 29, 1902.

ECUADOR.

Treaty of amity, commerce, and navigation, April 24, 1893.

FRANCE.

Treaty of amity, commerce, and navigation, November 27, 1886.
Parcels-post convention, December 10, 1891.
Regulations governing the same, January 22, 1892.
Trade-marks convention, April 10, 1899.

GERMANY.

Treaty of amity, commerce, and navigation, December 5, 1882.
Parcels-post convention, May 24, 1892.
Amendment to paragraph 1, article 4, of said convention, November 21, 1894.
Convention amending article 4 of the parcels-post convention of May 24, 1892, February 25, 1897.
Treaty for the protection of trade-marks, August 16, 1898.

GREAT BRITAIN AND IRELAND.

Preliminary to the resumption of diplomatic relations, August 6, 1884.
Treaty for the extradition of criminals, September 7, 1886.
Treaty of amity, commerce, and navigation, November 27, 1888.
Parcels-post convention, February 15, 1889.
Regulations governing same, March 12, 1890.
Regulations governing fiscal officers in connection with postal authorities, in fulfillment of the above-mentioned postal treaty, March 12, 1890.
Treaty of boundaries between Yucatán and Belize (British Honduras), July 8, 1893.

GUATEMALA.

Preliminary convention on boundaries, December 7, 1877.
Act extending the period fixed in article 8 of said convention, May 3, 1879.
Convention for the prorogation of the periods named in articles 7 and 8 of said convention, March 3, 1879.
Treaty of boundaries, September 27, 1882.

Convention extending for one year the period fixed by the above-mentioned treaty, June 8, 1885.
Convention extending the period fixed for the conclusion of the work of the joint commission on boundaries, October 6, 1886.
Convention for the same purpose, October 20, 1890.
Claims convention, January 26, 1888.
Convention extending the period for the conclusion of the work of the boundary commission, October 22, 1888.
Convention for the same purpose, October 20, 1890.
Claims convention, December 22, 1891.
Convention for the extradition of criminals, May 19, 1894.
Convention on boundaries, July 10, 1894.
Adjustment of the difficulties arising from the exercise of acts of sovereignty in Mexican territory, April 1, 1895.
Convention extending the period within which the boundary line must be drawn, March 16, 1896.
Convention for the same purpose, October 6, 1897.
Treaty of compulsory arbitration, January 29, 1902.

ITALY.

Convention to determine the nationality of Mexicans born in Italy and Italians born in México, August 20, 1888.
Treaty of amity, commerce, and navigation, April 24, 1893.
Treaty for extradition of criminals, May 22, 1899.

JAPAN.

Treaty of amity, commerce, and navigation, April 24, 1893.

NETHERLANDS.

Treaty of amity and commerce, September 22, 1897.

NICARAGUA.

Treaty of amity and commerce, November 6, 1900.

PARAGUAY.

Treaty of compulsory arbitration, January 29, 1902.

PERSIA.

Treaty of amity and commerce, May 14, 1902.

PERU.

Treaty of compulsory arbitration, January 29, 1902.

SALVADOR.

Treaty of amity, commerce, and navigation, April 24, 1903.
Convention for the exchange of publications, July 29, 1895.
Treaty of compulsory arbitration, January 29, 1902.

SPAIN.

Treaty for the extradition of criminals, November 17, 1881.
Convention for the authentication of signatures, October 11, 1901.
Treaty of arbitration, January 11, 1902.
Treaty on literary and artistic copyrights, March 26, 1903.

SWEDEN AND NORWAY.

Treaty of amity, commerce, and navigation, July 29, 1885.

UNITED STATES OF AMERICA.

Treaty of limits, concluded January 12, 1828, proclaimed April 5, 1832.
Treaty of limits, concluded April 5, 1831, proclaimed April 5, 1832.
Treaty of amity, commerce, and navigation, concluded April 5, 1831, proclaimed April 5, 1832.
Treaty of limits, concluded April 3, 1835, proclaimed April 21, 1836.
Claims convention, concluded April 11, 1839, proclaimed April 8, 1840.
Claims convention, concluded January 30, 1843, proclaimed March 31, 1843.
Treaty of peace, friendship, limits, and settlement (treaty of Guadalupe Hidalgo), concluded February 2, 1848, proclaimed July 4, 1848.
Treaty of boundary, cession of territory, transit of Isthmus of Tehuantepec, etc. (Gadsden treaty), concluded December 30, 1853, proclaimed June 30, 1854.
Extradition treaty, concluded December 11, 1861, proclaimed June 30, 1862.
Claims convention, concluded July 4, 1868, proclaimed February 1, 1869.
Naturalization convention, concluded July 10, 1868, proclaimed February 1, 1869.
Claims convention, concluded April 19, 1871, proclaimed February 8, 1872.
Claims convention, concluded November 27, 1872, proclaimed July 24, 1873.
Claims convention, concluded November 20, 1874, proclaimed January 28, 1875.
Claims convention, concluded April 29, 1876, proclaimed June 29, 1876.
Boundary convention, concluded July 29, 1882, proclaimed March 5, 1883.
Commercial reciprocity convention, concluded January 20, 1883, proclaimed June 2, 1884.
Boundary convention, Rio Grande and Rio Colorado, concluded November 12, 1884, proclaimed September 14, 1886.
Reciprocity convention, concluded February 25, 1885, proclaimed May 4, 1886.
Boundary convention, concluded December 5, 1885, proclaimed June 28, 1887.
Reciprocity convention, concluded May 14, 1886, proclaimed February 1, 1887.
Boundary convention, concluded February 18, 1889, proclaimed October 14, 1889.
Boundary convention, concluded March 1, 1889, proclaimed December 26, 1890.
Boundary convention, concluded August 24, 1894, proclaimed October 18, 1894.
Boundary convention, concluded October 1, 1895, proclaimed December 21, 1895.
Boundary convention, concluded November 6, 1896, proclaimed December 23, 1896.
Boundary convention, concluded October 29, 1897, proclaimed December 21, 1897.
Boundary convention, concluded December 2, 1898, proclaimed February 3, 1899.
Treaty for the extradition of criminals, concluded February 22, 1899, promulgated April 24, 1899.
Postal money-order convention, concluded September 2, 1899, promulgated October 2, 1899.
Convention extending indefinitely the time fixed by the boundary convention of March 1, 1899, concluded November 21, 1900, promulgated January 12, 1901.
Additional convention to the extradition treaty of February 22, 1899, concluded July 25, 1902, promulgated March 28, 1903.

URUGUAY.

Treaty of compulsory arbitration, January 29, 1902.

CHAPTER XX.

BIBLIOGRAPHY AND CARTOGRAPHY.

The following brief list of works on México is given here for the benefit of those who desire to have a better knowledge of the country, and merely as an index to the literature on the subject:

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CARTOGRAPHY.[a]

LIST OF MAPS OF MEXICO FROM 1858 TO 1898.

By P. Lee Phillips, *Chief of Maps and Charts Division, Library of Congress.*

Uricoechea (Ezequiel). Mapoteca Colombiana. Colección de los títulos de todos los mapas, planos, vistas, etc., relativos á la América Española, Brasil é islas adyacentes. xvi, 215 pp. 12°. Londres, Trübner & Cía., 1860.

NOTE.—Pages 35–53 contain a list of maps of México to 1860.

L. C.

Orozco y Berra (Manuel). Materiales para una cartografía mexicana. Edición de la Sociedad de Geografía y Estadística. xii, 337 pp. 1 l. 8°. México, Imprenta del gobierno, 1871. L. C.

[a] The initials L. C. stand for Library of Congress, Washington.

1858.

Atlas geográfico, estadístico é histórico de la República Mexicana, formado por Antonio García Cubas. 3 p. l. 31 maps. 2 pl. 4, 18 pp. + 1 l. fol. México, J. M. Fernández de Lara, 1888.

List of maps.

Carta 1. Carta general reducida.
2. Sonora.
3. Chihuahua.
4. Coahuila.
5. Nuevo León.
6. Tamaulipas.
7. San Luis Potosí.
8. Zacatecas.
9. Aguascalientes.
10. Durango.
11. Sinaloa.
12. Jalisco.
13. Guanajuato.
14. Michoacán.
15. Querétaro.
16. México.
17. Valle de México.
18. Puebla.
19. Veracruz.
20. Guerrero.
21. Oaxaca.
22. Chiapas.
23. Tabasco.
24. Yucatán.
25. Baja California.
26. Sierra Gorda.
27. Colima.
28. Tlaxcala.
29. Tehuantepec.
30. Territorios de Sierragorda é isla del Carmen.
31. Carta general de la República Mexicana.

Cuadro 1. Cuadro histórico-geroglífico de la peregrinación de las tribus Aztecas.
2. Cuadro histórico-geroglífico de la peregrinación de las tribus Aztecas que poblaron el valle de México.

L. C.

1858.

H. Kiepert's karte des nördlichen tropischen America. A new map of tropical America north of the equator, comprising the West Indies, Central America, Mexico, New Granada, and Venezuela. col. 38 x 63, fold. obl. 4°. Berlin, D. Reimer, 1858. L. C.

1859.

Map of the United States and Mexico. Published by Johnson & Browning under the direction of Col. Carlos Butterfield. Dec., 1859. col. fold. 30 x 36. [New York, 1859.] L. C.

1861.

Carta general de la República Mexicana. 10½ x 16. [In García Cubas (Antonio). Compendio de geografía. 16°. México, 1861.] L. C.

1861.

Memoria para servir á la carta general de la República Mexicana. Publicada por Antonio García Cubas. 168 pp. 1 l. 1 fold. map. 8°. México, Andrade & Escalante, 1861. L. C.

1861.

Colton (J. H.) Colton's map of the United States, Mexico, the West Indies, &c., 1861. col. 30 x 37, fold. 18°. [New York, J. H. Colton & co., 1861.] L. C.

1862.

Carte du Mexique représentant le plateau de l'Anahuac et son versant oriental par Hi. de Saussure, 1862. 22 x 21.

[In Société de géographie de Genève. Mémoires. 8°. Genève, 1862. v. 3, p. 60.]

L. C.

1862.

Carte du Mexique, 1:5800000, par J. Barthélemi. Paris, 1862, très gr. in-folio, coloriée.

1862.

Carte du Mexique, 1:4900000, par L. Sagansan. 1862, très gr. in-folio, coloriée.

1862.

Carta hidrográfica del valle de México. Levantada de orden del Ministerio de Fomento por los ingenieros Miguel Iglesias, Ramón Almaraz, Mariano Santa-María y José Antonio de la Peña, bajo la dirección del Ingeniero Geógrafo Francisco Díaz Covarrubias, antiguos alumnos del Colegio Nacional de Minería. 1862. 42½ x 26. México, H. Salazar, 1863. L. C.

1862.

Der mexicanische staat Puebla. Vollständige Reduction der Original-Aufnahme vom Baron Ferdinand von Heldtrich (Officier früher in k. preuss. dann in mexican. d.) publiciert in 4 bl. (Massstab 1:232,500) unt. d. titel: Carta del departamento de Puebla levantado de orden del Gobierno Supremo de la República Mexicana por R. Almazán 1855. Imprenta litográfica de A. Dastillero, Puebla. Redigirt v. H. Kiepert. Massstab der reduction 1:500,000. 23½ x 23½.

[In Gesellschaft für Erdkunde zu Berlin. Zeitschrift. Neue folge. 8°. Berlin, D. Reimer, 1862. v. 13. pl. 5.]

L. C.

1862.

Karte der 3 Staaten M., Puebla und Vera Cruz. ([Style on cover] Karte des Driegsschauplatzes zwischen Veracruz und México) mit dem Stadtplan von M. E. Jüger: Stuttgart, 1862.

The plan of the City of México is printed on the back of the map.

British Museum.

1862.

Map of México constructed from all available materials and corrected to 1862. By H. Kiepert.—H. Kiepert's karte von México, überdruck aus desselben karte des nördlichen tropischen America in 6 bl. 1856 mit neuen berichtigungen 1862. 22 x 27. fold. 8°. Berlin, D. Reimer, 1862.

L. C.

1862.

Nouvelle Carte du Mexique, donnant le Port de la Vera-Cruz, les environs de M., la partie Sud-Est des États-Unis, la mer des Antilles et l'Amérique Centrale. Dressée par A. Vuillemin . . . (Détails des Environs de M. et de la Vera-Cruz. La Guadeloupe. La Martinique.) J. Barthelemier: Paris, 1862.

British Museum.

1862.

Plan de México et de ses environs dans un rayon de huit kilomètres. Gravé chez Erhard. 16½ x 11. [In Nouvelles annales des voyages. 6me série. 8°. Paris, 1863, v. 33, p. 5.]

NOTE.—Inset: "Esquisse de l'itinéraire de la Vera-Cruz à México d'après H. Kiepert."

L. C.

1862.

Umgebung von Mexico bis Veracruz nach den von A. v. Humboldt, v. Gerolt, Heller, Smith und der Sociedad Mejicana de Geografía y Estadística veröffentlichten Karten und der Aufnahme des Staates Puebla von Almazan und F. v. Heidreich, zusammengestellt v. H. Kiepert. 6¾ x 9½.

[In Gesellschaft für Erdkunde zu Berlin. Zeitschrift. Neue folge. 8°. Berlin, D. Reimer, 1862. v. 12. pl. 6.]

L. C.

1863.

Carta general de la República Mexicana, formada par Antonio García Cubas. 1863. 47 x 56. México, H. Iriarte & Ca., 1863. L. C.

1863.

Carte de la Sonora, avec l'indication de ses mines d'après la carte de A. García Cubas et les cartes américaines par V.-A. Malte-Brun. 9½ x 8.

[In Nouvelles annales des voyages. 186. 6me série. 8°. Paris, A. Bertrand, [1865], p. 256.]
NOTE.—Same map found in 177-187. 6me série. 33-34. 1863.

L. C.

1863.

Carte de la Sonora, avec l'indication de ses mines d'après la carte de A. García Cubas et les cartes américaines par V.-A. Malte-Brun. Gravé chez Erhard. 9½ x 7¾.

[In Nouvelles annales des voyages. 6me série. 8°. Paris, 1863, v. 34, p. 129.]

L. C.

1863?

Mexico und die Republiken von Central-America. Bearbeitet von C. Gräf. (Tehuantepec Eisenbahn-Project. Bearbeitet von Barnard, 1851. Honduras. Eisenbahn-Project. Bearbeitet von E. G. Squier u. W. N. Jeffers, 1853.) Weimar, [1863?] British Museum.

1863.

Plan de Mexico et des environs dans un rayon de huit kilomètres. [Also] Esquisse de l'itinéraire de la Vera-Cruz à Mexico d'après H. Kiepert. 16½ x 11.

[In Nouvelles annales des voyages. 177-178. 6me série. 33-34. 8°. Paris, A. Bertrand, 1863.]
NOTE.—This map also found in "Revue maritime coloniale," 1863, v. 7, p. 692.

L. C.

1864.

Essai d'une carte ethnographique du Mexique d'après les travaux de Clavigero, de Humboldt, de Beltrami, de Stephens, de Duflot de Mofras et de Brasseur de Bourbourg, par V.-A. Malte-Brun, 1864. Échelles au 1:7000000. Gravé chez Erhard. 13 x 18½.

[In Nouvelles annales des voyages. 6me série. 8°. Paris, 1864, v. 39, p. 5.]
NOTE.—Inset: "Vallée de México."

L. C.

1864.

Geological map and profiles of some of the principal mining districts of Mexico. Scale of 12 miles to 1 inch or 1 : 760320. 2 maps, each 28 x 28.

[In Egloffstein (F. W.) Contributions to the geology and the physical geography of Mexico. 8°. New York, D. Appleton & Co., 1864, at end.]

NOTE.—"Egloffstein is only the editor. The true author of the geological map, profiles, and descriptions is Baron Frederick von Gerolt, formerly Prussian minister at Mexico and afterwards at Washington."

1865.

Carta general del Imperio Mexicano. Formada y corregida con presencia de los últimos datos y el auxilio de las autoridades más competentes. Decaen y Debray, editores. Col. fold., 31 x 45. México, Decaen & Debray, 1865. L. C.

1865.

Itinéraire de Mexico à Durango, dessiné par E. Picard d'après les croquis de route de l'abbé Domenech. 1865. 12 x 17.

[In Société de géographie. Bulletin. 5e série. 8°. Paris, 1866, v. 12, p. 272.]

L. C.

1865.

Schönberg's map of Mexico. Fold. 14 x 23. [New York, Schönberg & Co., 1865.] L. C.

1867.

Johnson's Mexico. Col. 11½ x 17. New York, A. J. Johnson, [1867]. L. C.

1867.

Nouvelle carte du Mexique, du Texas et d'une partie des États limitrophes . . . par H. Brué . . . Revue et augmentée par A. Vuillemin. (Détails des environs de Mexico et de la Vera-Cruz. Complément de la carte, donnant le Yucatan et une partie des provinces unies de l'Amérique Centrale.) Paris, 1867.

British Museum.

1867.

Plano de la Ciudad de México. Levantado de orden del Ministerio de Fomento por sus ingenieros. 1867. 28 x 39½. México, E. M. Sagredo, [1867]. L. C.

1867.

Traveling and military map of Sonora. From private field notes by Cummings & James Cherry. 27 x 30. [Pittsburg, Cummings & J. Cherry, 1867.] L. C.

1868.

Map of Lower California. From special surveys of coast and interior, made for the Lower California Company in 1866–67. By the company's engineers, under direction of J. Ross Browne. Drawn by Joseph Goldsheider, civil engineer and topographer, January, 1868. 17¾ x 14¾. [New York, N. Y. Lith. and Printing Co.], 1868. L. C.

1868.

Originalkarte der californischen Halbinsel nach den Aufnahmen der für die Lower California Company ausgeführten Expedition unter J. Ross Browne, W. M. Gabb und F. Loehs [etc.]. 13 x 9. Gotha, J. Perthes, 1868.

[In Petermann (A.) Mittheilungen. 4°. Gotha, J. Perthes, 1868, pl. 14, p. 272.]

L. C.

1868.

Plano corográfico de una parte del Estado de Campeche, que comprende todo el márgen derecho del río Usumacinta hasta sus confines, en el que está incluso el partido del Cármen. Formado por el agrimensor geómetra F. R. Shiels, 1868. 25 x 21.

[In Sociedad de Geografía y Estadística de la República Mexicana. Boletin. Segunda época. 4°. México, J. M. Sandoval, 1870, v. 2, at end.]

L. C.

1869.

Carta general de la República Mexicana. 15 x 20.

[In García Cubas (Antonio). Curso elemental de geografía universal. 8°. México, 1869.]

L. C.

1869.

Carta general de la República Mexicana. 19½ x 26½.

[In México y sus alrededores. Fol. México, V. Debray, 1869.]

L. C.

1869.

Plano general de la Ciudad de México. 1869. Escalas de 1,000 varas castellanas. 24 x 32.

[In México y sus alrededores. Nueva edición aumentada. Fol. México, V. Debray, 1869.]

L. C.

1870.

Carta general de la República Mexicana. Formada y corregida en vista de los últimos datos. Escala de leguas mexicanas de 26 y ½ al grado. 20 x 26½.

[In México y sus alrededores. Nueva edición aumentada. Fol. México, V. Debray, 1869.]

L. C.

1871.

Carte du chemin de fer interocéanique de Mexico (la grande ligne naturelle entre l'Europe et l'Asie) et du chemin de fer interamérique (la grande ligne naturelle entre l'Amérique du Nord et l'Amérique du Sud). Léon, auteur, constructeur et propriétaire. 22 x 28½. [New York, G. W. & C. B. Colton & Co., 1871.]

L. C.

1873.

Carte du Mexique. Dressée au Dépôt de la guerre, par Mr. Niox, capitaine d'état-major. D'après les levés des officiers du corps expéditionnaire et les renseignements recueillis par le Bureau topographique. Échelle=1:3000000. Paris, 1873.

Published by authority of the honorable Secretary of War in the office of the Chief of Engineers, U. S. Army. 27½ by 41½. [Washington], 1881.

1873.

Carta geográfica y administrativa de los Estados Unidos Mexicanos, formada con presencia de los datos más exactos y recientes, por el ingeniero Antonio García Cubas . . . 1873. 1:2000000.

1873–1874.

Carte du Méxique. Dressée au Dépôt de la guerre. Par Mr. Niox, d'après les levés des officiers du corps expéditionnaire et les renseignements recueillis par le Bureau topographique. 2 sheets fold. 28 by 41. Paris, ve. Ethiou-Pérou, 1873. [And] Notice sur la carte du Méxique. Extrait du Bulletin de la Société de géographie. Anon. 22 pp. 8°. Paris, J. Dumaine, 1874. L. C.

1873–1875.

C. Dewey's Aufnahme der Californischen Halbinsel under der mexikanischen Küsten. 1873–74. Von A. Petermann. 21 by 7½. Gotha, J. Perthes, 1875.

[In Petermann (A.) Mittheilungen. 4°. Gotha, J. Perthes, 1875. v. 21, pl. 9.]

L. C.

1874.

Atlas metódico para la enseñanza de la geografía de la República Mexicana . . . A. García Cubas. México, 1874. L. C.

1874.

Case's map of the United States, British Provinces, Mexico, and part of the West Indies. Col. 60 by 70. Hartford, O. D. Case & Co., 1874. L. C.

1874.

Cram's railroad and county map of the United States, Canada, and Mexico. 38 by 54. Chicago, G. F. Cram, 1874.

NOTE.—On the reverse side is an historical map of the world.

L. C.

1874.

The granger's map of the United States, British Provinces, West Indies, Mexico, and Central America. [By Gaylord Watson, anon.] 38 by 50. Chicago, Watson's Chicago branch, 1874. L. C.

1876.

Map of the three great tropical American railways, viz: 1st. The Yucatan Central. 2d. The Yucatan Pacific. 3d. The Great Central and Southern American. Leon and Harriet Lewis, projectors, builders, and proprietors.

[Prepared by G. W. & C. B. Colton & Co. 22 x 28. [New York, G. W. & C. B. Colton & Co., 1876.]

L. C.

1876.

William's [G. W.] copperplate map of the United States, Canada, Mexico, Central America, West Indies, etc. 63 x 63. Philadelphia, J. M. Atwood, [1876].

L. C.

1877.

Carta administrativa-itineraria de la República Mexicana. Secretaría de Estado y del Despacho de Fomento. Comisión de cartografía, bajo la dirección del ing. A. Díaz. No. 1. Expendio, en el archivo de cartas. Constr-y-dib,-C. Alvarez y R. Tangassilit-Salazar. I^{a} edición, 1877. 17½ x 23¾. [México], 1877.

L. C.

1877.

República Mexicana. Plano del Istmo de Tehuantepec. 1:250000. Government of Mexico, 1877. U. S. War Dept. lib.

1878.

Karte der Halbinsel Yucatan, hauptsächlich nach der von Joachin Hübbe und Andres Aznar Perez zusammengestellten und von C. Hermann Berendt revidirten und vermehrten Mapa de la península de Yucatan, von 1878. 13 x 17¼. Maassstab 1:1600000.

[In Petermann's Mittheilungen. 1879. 4°. Gotha, J. Perthes, [1879]. v. 25, pl. 11 at end.]

L. C.

1879.

New map of Mexico, engraved expressly for "Lester's Mexican Republic." 1879. Prepared by G. W. & C. B. Colton & Co., [1879]. L. C.

1879.

Voyage en Sonora (Mexique) par A. Pinart, 1879. Échelle de 1:4000000. 4½ x 5½.
[In Société de géographie. Bulletin. 6e série. 8°. Paris, 1880. v. 20, at end.]

1880.

Mexico and Central America. By W. Hughes. (Enlarged Plan of the Isthmus of Panama.) London and Liverpool, G. Philip & Son, [1880?].
British Museum.

1881.

Cram's new indexed county and railroad map of the United States, Canada, and Mexico. Compiled from official records of the Land Department, of Washington, D. C. Drawn and engraved by G. F. Cram. 49 x 80. Chicago, G. F. Cram, 1881. L. C.

1881.

Map of Mexico, Central America, and Isthmus of Panama, showing railroads, proposed railroads, etc. 37½ x 56¾. New York, G. Watson, 1881. L. C.

1881.

Map of the Mexican National Railway, showing the lines granted by the Mexican Government to the Mexican National Construction Company. (Palmer-Sullivan concession.) From the map of Captain Nioux [Niox], published in the office of the Chief of Engineers, U. S. A. 1881. Scale, 1:3000000. 27¾ x 41½. Washington, 1881.
NOTE.—Inset: "Map showing the political divisions."
L. C.

1881.

Nuevo mapa de los Estados de Sonora, Chihuahua, Sinaloa, Durango y territorios de la Baja California. Formada por G. de Fleury. 24 x 34. San Francisco, published by A. Gensoul, revised by W. Holt, 1881. L. C.

1881–1882.

Official map of southern Arizona and of the States of Sonora, Chihuahua, Sinaloa, Durango. Prepared especially for the mining record. Compiled from surveys, reconnoissances, and other sources, by Guillermo Rose. 1882. 26 x 34. New York, J. Bien, photo., [1881]. L. C.

1882.

"Commercial Herald." The southwestern railroad system, United States and Mexico. Supplement to the "Commercial Herald" and "Market Review." Jan., 1882. 22 x 34. San Francisco, H. S. Crocker & Co., [1882]. L. C.

1882.

Karte der Vereinigten Staaten von Nord-Amerika nebst Mexico . . . Entworfen von Dr. J. M. Ziegler. Gezeichnet von T. von Bomsdorff. 1882.
British Museum.

1882.

Map of Sinaloa, with statistical and geological notes. By Frederick G. Weidner. 1 pl. 19 pp. 1 map, 35½ x 29, fold. 8°. San Francisco, Francis Valentine & Co., [1882]. L. C.

1882.

Map of the Republic of Mexico. Revised and corrected by Lorenzo Castro, drawn by Theodore Gentilz. 30 x 44. New York, Thompson & Moreau, [1882].

[In Castro (Lorenzo). The Republic of Mexico in 1882. 12°. New York, 1882.]

L. C.

1882.

Nuevo mapa estadístico y ferrocarillero de México y la frontera del norte.—New statistical and railroad map of Mexico and the northern frontier. Showing the products of the different zones [etc.], by A. K. Owen and Albert von Motz. 1882. col. 44 x 60. Philadelphia, J. L. Smith, 1882. L. C.

1883.

Dahlgren (Charles Bunker). Historic mines of Mexico. 1 p. l., 220 pp. 2 portraits. 20 maps. 8°. New York, for the author, 1883.

List of maps.

Hypsometric map of the Republic of Mexico.
Production map.
Map of Central Mexico (Guanajuato, Zacatecas, and San Luis Potosí).
Map of Guanajuato and Veta Madre.
Section of Valenciana.
Map of Veta Grande (Zacatecas), Descubridora, and Quebradilla.
Map of Pinos.
Map of Fresnillo.
Map of Sombrerete.
Map of Catorce.
Map of Northwestern Mexico (Sonora, Sinaloa, Chihuahua, Durango).
Map of Guadalupe de los Reyes.
Map of Rosario.
Map of Batopilas.
Map of Parral.
Map of Cusihuiriachic.
Map of San Dimas.
Map of Southern Mexico.
Map of Tlalpujahua.
Map of Pachuca and Real del Monte.

1883.

El Corazon del Anahuac y sus ferrocarriles. 1:250000. 1883. Published by the Major & Knapp Eng. and Mfg. and Lith. Co., N. Y. U. S. War Dept. lib.

1883.

Map of the Texas, Topolobampo and Pacific R. R. and Tel. Co., from Chihuahua and Parral to Topolobampo Harbor. 1:5280 (about 12 miles to the inch). Albert von Motz. Published by T. T. & P. R. R. Tel. Co., 1883.

U. S. War Dept. lib.

1883.

Steamship line and railroad map of the Merchants' and Tourists' Guide to Mexico. 13 x 19. Chicago, C. W. Laremba, 1883. L. C.

1883.

Watson's nuevo mapa de México y la frontera del Norte, América Central, Istmo de Panamá, Cuba, Jamaica, and Bahama Islands. 38 x 55. Nueva York, G. Watson, 1883. L. C.

1883–1884.

Memoria presentada al Congreso de la Unión por el Secretario de Estado y del Despacho de Fomento, Colonización, Industria y Comercio de la República Mexicana, General Cárlos Pacheco. Corresponde á los años trascurridos de enero de 1883 á 1885. v. 6. Atlas. 2 p. l. 48 maps. Fol. México, Oficina tipográfica de la secretaría de fomento, 1887.

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Carta general telegráfica de los Estados Unidos Mexicanos, comprendiendo lo construido y en explotación en las diversas líneas hasta junio de 1885.

Sheet 1. Diagrama que manifiesta el estado de las hojas de publicación á la 100,000ª en junio 30 de 1885. Región del norte.
2. Canevás de las operaciones topográficas ejecutadas hasta junio 30 de 1885. Región del norte. (Fracción superior.)
3. Canevás de las operaciones topográficas ejecutadas hasta junio 30 de 1885. Región del norte. (Fracción inferior.)
4. Diagrama que manifiesta el estado de las hojas de publicación á la 100,000ª en junio 30 de 1885. Región central y de oriente.
5. Canevás de las operaciones topográficas ejecutadas hasta junio 30 de 1885. Región central y de oriente. (Fracción superior.)
6. Canevás de las operaciones topográficas ejecutadas hasta junio 30 de 1885. Región central y de oriente. (Fracción inferior.) Carta general de la República Mexicana.
7. Territorio de la Baja California. Carta de la 1ª fracción de la zona.
8. Territorio de la Baja California. Carta de la porción la 1ª, 2ª fracción de la zona.
9. Territorio de la Baja California. Carta de la porción 2ª de 1ª, 2ª fracción de la zona.
10. Territorio de la Baja California. Carta de la porción 1ª de la 3ª fracción de la zona.
11. Territorio de la Baja California. Carta de la porción 2ª de la 3ª fracción de la zona.
12. Plano de la triangulación practicada entre Campo Astronómico y Cabo Haro, en el puerto de Guaymas.
13. Plano del puerto de Guaymas, con un proyecto para el mejoramiento de sus condiciones sanitarias.
14. Mapa del cantón Meoqui. Estado de Chihuahua.
15. Mapa del cantón Balleza. Estado de Chihuahua.
16. Mapa del cantón Jiménez. Estado de Chihuahua.
17. Mapa del cantón Camargo. Estado de Chihuahua.
18. Puente para el rio Atoyac. Dirección del camino de Tehuacán á Puerto Ángel por Oaxaca. Plano núm. 1.
19. Ferrocarril Hidalgo. Proyecto para el ensanche de la estación de Pachuca y alineamiento del camino que conduce á México.
20. Ferrocarril de Mérida á Calkini. Proyecto de estación en Umán.
21. Ferrocarril de Puebla á Izúcar de Matamoros. Sección 1ª de Puebla á Cholula. Proyecto del Puente de la Unión sobre el rio Atoyac.
22. Ferrocarril de Puebla á Izúcar de Matamoros. Sección 2ª de Cholula á Atlixco. 2º tramo. Puente de Teyecatl.
23. Ferrocarril de Puebla á Izúcar de Matamoros. 2ª sección de Cholula á Atlixco. Puente de Tejaluca en el kilómetro 43.
24. Plano topográfico del rio Chubiscar en una zona de 2 kilómetros á cada lado de la linea del puente del Ferrocarril central mexicano.
25. Ferrocarril central mexicano. Plano de una de las trabas del puente sobre el rio Grande del Norte.
26. Ferrocarril central mexicano. Plano de la fundación estacada y de los apoyos del puente sobre el rio Grande del Norte.
27. Plano topográfico del rio Conchos en una zona de 2 kilómetros á cada lado de la linea del puente del Ferrocarril central mexicano.
28. Plano general del puente sobre el rio Conchos.
29. Puente sobre el rio Salto. Ferrocarril central. División de San Luis Potosí á Tampico.
30. Detalles del puente sobre el rio Salto. Ferrocarril central mexicano.

Sheet 31. Ferrocarril central. División de San Luis Potosí á Tampico. Pilares del centro y del este del puente sobre el río Salto, en Santa Rosa.
32. Ferrocarril central. División de San Luis Potosí á Tampico. Estribo oeste del puente sobre el río Salto, en Santa Rosa.
33. Ferrocarril central. División de San Luis Potosí á Tampico. Plano y detalles del puente provisional, sobre un agujero en el kilómetro 118.
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35. Ferrocarril central. Mampostería y cimientos para el puente sobre el río Tamasopo.
36. Ferrocarril central mexicano. División de Tampico. Puente sobre el río Choy.
37. Ferrocarril central mexicano. Línea del Pacífico. División oriental. Líneas y reconocimientos entre Guadalajara y Lagos.
38. Ferrocarril de Puebla á San Márcos y Villa de Libres. Puente en la barranca de Xalcatl. Tercera sección.
39. Rada de Salina Cruz.
40. Proyecto de muelle para el puerto de Salina Cruz.
41. Canal n. del Chijol. Proyecto de trazo final para someterlo á la aprobación del Supremo Gobierno.
42. Faro y torre para el puerto de Guaymas, establecidos por la Compañía del ferrocarril de Sonora.
43. Plano de una parte del Estado de Colima. Proyecto de saneamiento para el puerto de Manzanillo.
44. Muelle para el puerto de Manzanillo.
45. Muelle para el puerto de Manzanillo.
46. Muelle para el puerto de Manzanillo.
47. Proyecto de monumento á la memoria de Sor. Juana Inés de la Cruz.

L. C.

1884.

Carta ferrocarrilera de México, con los datos más recientes acerca de unas y otras líneas. Expresamente formada por ingenieros de la Secretaría de Fomento del Gobierno Federal para el primer almanaque histórico, artístico y monumental de la República Mexicana. Publicado por Manuel Caballero, editor de "El Noticioso," México. Scale: 1:3800000. 23¾ x 35½. New York, G. W. & C. B. Colton & Co., [1884]. L. C.

1884.

Carta topográfica general de los alrededores de Puebla, formada por la Comisión geográfico-exploradora. 1:50000. Published by Mexican Government, 1884. 3d serie 6ª. A. P. U. S. War Dept. lib.

1884.

Der Staat Sinaloa in Mexico. Nach eigenen Aufnahmen und Rekognoscirungen von Friedrich G. Weidner. 16½ x 13½. Gotha, J. Perthes, 1884.
[In Petermann (J.) Mitthellungen. 4°. Gotha, 1884. v. 30, pl. 1.]

L. C.

1884.

General map of the Republic of Mexico, showing railroads, steamships, and telegraph communications. 1:2217600. Published by Rand & McNally, Chicago, 1884. Corrected to 1884. In four sheets. U. S. War Dept. lib.

1884.

Carta topográfica general de los alrededores de Puebla. Formada por la Comisión geográfico-exploradora. Secretaría de Estado y del Despacho de Guerra y Marina. Comisión geográfica de fomento y guerra. Bajo la dirección del ing. Al. Díaz. Levantamiento: varios individuos de la comisión. Construcción: cap. 1° E. M.—Beltran. Dibujo y escrituras: Ing. C. T. Alvarez. Edición de 1884. 3ª serie. Letra A. P. 19½ x 25¾. Escala de 1:50000—1^{mm}=50 metros. L. C.

1884.

Mapa de la red telegráfica y de los itinerarios generales de la República Mexicana. Formado según datos oficiales por F. A. Labadie. 21½ x 27½. San Francisco, Cal., Gregoire, Tauzy y Ca., [1884].

NOTE.—Another copy, traced on linen, in the library.

L. C.

1884.

Mexico, Central America, and the West Indies. Drawn and engraved expressly for the Encyclopædia Britannica, American reprint. Scale, 95 miles—one inch. 19 x 27. Philadelphia, J. M. Stoddart Co., [1884].

NOTE.—Copyright in 1884 by Roger Sherman.

L. C.

1884.

México. Mapa de las líneas del ferrocarril central y conecciones. Escala del mapa 1:6000000. 14½ x 20½. Buffalo, N. Y., Matthews, Northrup & Co., 1884.

NOTE.—Copyrighted by the Mexican Central Railway Co., Limited 1884.

1884.

Mexique. Échelle, 1:5000000.

[In Vivien de St. Martin (Louis). Atlas universel de géographie. Fol. Paris, Hachette, 1884. Pt. 78.]

L. C.

1884.

Poole Bros. Railway map of Mexico. 14½ x 20½. [Chicago, Poole Bros., 1884.]

L. C.

1884.

Watson's nuevo mapa de México y la frontera del norte, América Central, Istmo de Panama, Cuba, Jamaica y islas de Bahama. 37 x 54. Nueva York, G. Watson, 1884. L. C.

1884–1889.

International (water) Boundary Commission. United States and Mexico. Treaties of 1884 and 1889. Brownsville and Matamoras jetties, report of Col. Anson Mills, 3d U. S. Cav. Maps by engineers of commission and Capt. M. M. Mendiola, Mexican engineer. Washington. 19, 5 pl., 5 sheets of maps.

No. 1, reference map, showing Rio Grande and vicinity of Brownsville, with river as located by the commission of 1888. Scale, 1:5000. No. 2, Rio Grande sections and cross-sections at Fortin Paredes and Freeport. Scale, 1:1000. No. 3, Rio Grande, jetties and cross-sections in the vicinity of Brownsville, Texas and Matamoras. Tamaulipas, Dec., 1894. Scale, 1:1000. No. 4, Bends of the Rio Grande at Casa Matar and artillery quarters. Scale, 1:1000. No. 5, comparative map of river and jetties in the vicinity of Brownsville, Fort Brown, and Santa Cruz Point, showing the surveys of 1853, 1869, 1875, 1877, 1880–82, 1894. Scale, 1:2000.

U. S. War Dept. lib.

1885.

Atlas Mexicano, por Antonio García Cubas. 31 sheets incl. Carta general. fol. México, Debray, suc's, 1885.

Contents.

Carta 1. Sonora. Escala 1:2000000.
2. Chihuahua. Escala 1:2000000.
3. Coahuila. Escala 1:2000000.
4. Nuevo Leon. Escala 1:1200000.
5. Tamaulipas. Escala 1:1500000.

Carta 6. Veracruz. Escala 1:1200000.
7. Tabasco. Escala 1:1200000.
8. Campeche. Escala 1:1200000.
9. Yucatán. Escala 1:1200000.
10. Sinaloa. Escala 1:1500000.
11. Jalisco. Escala 1:1500000.
12. Colima. Escala 1:500000.
13. Michoacán. Escala 1:1000000.
14. Guerrero. Escala 1:1000000.
15. Oaxaca. Escala 1:100000.
16. Chiapas. Escala 1:1200000.
17. Durango. Escala 1:1200000.
18. Zacatecas. Escala 1:1200000.
19. Aguascalientes. Escala 1:300000.
20. San Luis Potosí. Escala 1:1325000.
21. Guanajuato. Escala 1:600000.
22. Querétaro. Escala 1:480000.
23. Hidalgo. Escala 1:6000000.
24. México. Escala 1:500000.
25. Morelos. Escala 1:250000.
26. Puebla. Escala 1:900000.
27. Tlaxcala. Escala 1:230000.
28. Baja California. Escala 1:3000000.
29. Distrito Federal. Escala 1:245000.
30. Territorio de Tepic.

1885.

Map of the City of México, authorized for publication with the Mexican guide, by General Carlos Pacheco, Minister of Public Works. 1885. 17 x 24.

[In Janvier (Thomas A.) The Mexican guide. 5th ed. 16°. New York, C. Scribner's Sons, 1890, at end.]

L. C.

1885.

Map of the United States and Territories, with adjacent parts of Canada and Mexico; also part of the West Indies. 1:2534400. (40 miles to the inch.) U. S. General Land Office. U. S. War Dept. Lib.

1885.

Mapa general de México. Ferrocarril Central, México. 1885. (Blue print, 1 sheet.) U. S. War Dept. Lib.

1885.

Official map of the State of Sonora. 1885. By Chas. E. Herbert. 23 x 27. 1 sheet fold. 18°. [n. p., 1885.]

NOTE.—On cover, date 1884. Title in Spanish and English.

L. C.

1886.

Map of the environs of the City of Mexico. Authorized for publication with the Mexican Guide, by General Carlos Pacheco, Minister of Public Works. 1886. 11½ x 18½.

[In Janvier (Thomas A.) The Mexican Guide. 5th ed. 16°. New York, C. Scribner's sons, 1890. at end.]

L. C.

1886.

Mexico. 16½ x 23.

[In Janvier (Thomas A.) The Mexican Guide. 5th ed. 16°. New York, C. Scribner's sons, 1890. at end.]

NOTE.—Map copyrighted in 1886, by W. M. Bradley & bro.

1886.

Outline map of field operations against hostile Chihuahua Indians, 1:950,400 (15 miles to the inch). By Lieut. E. J. Spencer, C. of E., engr. officer, department of Arizona. 1886. U. S. War Dept. Lib.

1887.

Carta telegráfica y ferrocarrilera de la República Mexicana. Dirección general de estadística, secretaría de fomento, 1887. Escala de 1:3000000. 27¾ x 37½.
L. C.

1888.

Carta general de la República de Méjico y de los Estados Unidos del Norte, con relación á las propiedades de la Compañía minera de fierro mejicana. Scale: 1:3800000. 32½ x 44½. New York, G. W. & C. B. Colton & co. [1888].
L. C.

1889.

Bancroft's map of the mineral districts of northern Lower California. Designed by Fred J. Engelhardt, March 1, 1889. Compiled from official authentic maps and sketches [on record] from special investigation in person and assisted by the oldest and most expert Mexican prospectors, 1888–1889. 16½ x 19. San Francisco, The Bancroft company, 1889.
L. C.

1889.

Bosquejo de una carta geológica de la República Mexicana. Formada por disposición del Secretario de Fomento, Gral. Carlos Pacheco, por una comisión especial bajo la dirección del profesor Antonio del Castillo, 1889. Escala de 3,800,000°. 29 x 41½. Paris, Erhard hermanos, [1889].
L. C.

1889.

Cartes commerciales—Etats-Unis du Mexique (1st pt., north Mexico; 2d pt., south Mexico), 1:3000000. F. Bianconi, Paris, 1889. (Forms 7th series, nos. 4 and 5, of geographical memoirs published by Chaix, Paris). U. S. War Dept. Lib.

1888.

Memoria para la carta general geográfica de la República Mexicana. Año de 1889. 27 pp., 1 l. 8°. México, Oficina tip. de la Secretaría de Fomento, 1890.
L. C.

1889.

Mexico. 1:4435200. (70 miles to inch.) Bradley & co., Phil., 1889.
U. S. War Dept. Lib.

1889.

Plano geológico del Real de S. Antonio y el Triunfo de la Baja California: Formado por Antonio del Castillo, ingeniero de minas. Revisado en 1889. 25½ x 21½. México, E. M. Moreau y ho. [1889].

NOTE.—Inset: "Estremidad sur de la peninsula de la Baja California. Bosquejo geológico."
L. C.

1889.

United States with adjacent portions of Mexico. 1885. Corrected to 1889. Scale, 1:5000000. 4 sheets. U. S. War Dept. Lib.

1890.

Carta general de la República Mexicana. Formada en el Ministerio de Fomento con los datos más recientes, por disposición del secretario del ramo, General Carlos Pacheco, 1890. Escala de 1:2000000. 44½ x 68. Paris, Erhard hermanos, [1890]. L. C.

1890.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. Secretaría de Fomento, sección tercera. Escala: 1:2000000. 44½ x 66. Paris, Erhard hermanos, 1890. L. C.

[1890?]

Carta minera de la República Mexicana. Formada por disposición del Secretario de Fomento, Gral. Carlos Castillo. Escala de 3,000,000. 29 x 41½. Paris, Erhard hermanos, [1890?]

1891.

Map of Mexico, prepared under the direction of Captain Daniel M. Taylor, Ordnance Department, and 1st Lieutenant George P. Scriven, Signal Corps, in the military information division, Adjutant-General's Office, War Department; William N. Peck, chief of division, by Charles H. Ourand, draughtsman. 1891. 30¾ x 40½. L. C.

1891.

Rand, McNally & co.'s indexed Atlas of the World. Map of Mexico. Statute miles, 69.16—1 degree. Kilometers, 111.307—1 degree. 19 x 26. Chicago, Rand, McNally & co., 1891.

NOTE.—Inset of "Valley of Mexico on an enlarged scale."

L. C.

1891.

Reducción del plano oficial de la ciudad de México. Levantado de orden del H. Ayuntamiento por la Comisión de saneamiento y desagüe en 1889 y 1890 detallado ampliamente y publicado por la antigua y acreditada casa C. Montauriol y ca., 1891. 29 x 38¾. L. C.

1891–1892.

Carta de la República. 1:100000. 1 Bl. 18. I. M. México.—N. Tetzmeloccan.—O. Huamantla.—S. Popocatepetl.—T. Puebla.—11. K. Lanos.—P. Chalchicomola.—U. Tlacoyalco.—V. Orizaba.—lv. A. Tehuacán. México, Secretaría de Fomento. Carte des États-Unis du Mexique dressée par les soins de la Société de géographie de Lille d'après les plus récents documents officiels. B. S. géogr. Lille 18. Díaz, A. Carta topográfica general de los alrededores de Puebla, formada por la Comisión Geográfica Exploradora. Edición de 1884. (3e série.) 1:50000. Paris, impr. Erhard. Jaccottey, P., et M. Mabyre. Carte des services maritimes posteaux des Antilles et du Mexique. Paris, Delagrave, édit. Rand, McNally & co.'s indexed (pocket) map of Mexico. New York and Chicago. cl.

Taken from "Bibliotheca geographica," 1891 and 1892.

1891–1893.

Bosquejo de una carta geológica de la República Mexicana. Formada por disposición del Secretario de Fomento por una comisión especial bajo la dirección de Antonio de Castillo. Reformada con nuevos datos en 1891, 1892 y 1893. Escala: 1:10000000. 10½ x 14½. México, E. M. Moreau, [1893]. L. C.

1891–1896.

Report of the international boundary commission. United States and Mexico. 1891–1896. Mape title. 26 maps. fol. Washington, Government Printing Office, 1898.

List of maps.

Index map of the boundary.
California line.
Colorado River section of the boundary (in colors).
Arizona—Sonora oblong line.
Parallel 31° 20′ north latitude.
Meridian section.
Parallel 31° 47′ north latitude.
Profile of the boundary.

L. C.

1892.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. 1:2000000. 1890. Corrected to 1892. Published by the Mexican Government.

U. S. War Dept. Lib.

1892.

Map of Mexico. About 1:3000000 (45 miles to inch). By C. H. Ourand. Published by Bureau of Military Information, War Department, 1891. Revised ed., 1892.

U. S. War Dept. Lib.

1892–1893.

Krater-Typen in Mexico und Guatemala. Nach Aufnahmen von Dr. Carl Sapper, 1892 und 1893. 12 x 8¼. [In Petermann's Mittheilungen, 1894. 4°. Gotha, J. Perthes, [1894]. v. 40, pl. 8. at end.] L. C.

1893.

Carta de los ferrocarriles de los Estados Unidos Mexicanos. 1893.

U. S. War Dept. Lib.

1893.

Carta de los meteoritos de México, ó regiones de la República en que han caído fierros y piedras meteóricas. Formada, bajo los auspicios de la Secretaría de Fomento, por Antonio del Castillo, ingeniero de minas, director de la Escuela Nacional de Ingenieros y de la Comisión Geológica. Escala: 1:10000000. 14¾ x 10½. México, Moreau y ho., [1893]. L. C.

1893.

Carta minera de la República Mexicana. Formada, por disposición del Secretario de Fomento, por el ingeniero de minas, Antonio del Castillo. Corregida en 1893. Escala: 1:2000000. 42½ x 66. México, E. M. Moreau y ho., [1893].

1893.

Plano de la ciudad de México. 10½ x 15½. [In Diccionario enciclopédico hispano-americano. 8°. Barcelona, Montaner & Simón, 1893. v. 12, bet. pp. 740–741.] L. C.

1893.

Castillo (Antonio del). Bosquejo de una carta geológica de la República Mexicana. 1:10000000. Comisión Geológica Mexicana. México.

—— Carta de los meteoritos de México, ó regiones de la República en que han caído fierros y piedras meteóricas. 1:10000000. Comisión Geológica Mexicana. México.

—— Cartas geológicas de pozos artesianos abiertos en la Gran Cuenca de México. Comisión Geológica Mexicana. México.

—— Plano geológico del Peñón de los Baños. 1:4000. Comisión Geológica Mexicana. México.

—— Plano geológico y petrográfico de la Cuenca de México, región sw. 1:2000000. Comisión Geológica Mexicana. México.

—— Cabañas (L.) y Ordoñez (E.) Plano geológico de las minas de fierro de la Ferriera, de la Encarnación y del distrito minero de S. José del Oro. 1:20000. Comisión Geológica Mexicana. México.

Taken from "Bibliotheca Geographica, 1893."

1893.

Plano geológico y petrográfico de la cuenca de México, región SW. Formado por Antonio del Castillo y Ezequiel Ordoñez, 1893. No. 1.—SW. de la cuenca de México. Escala: 1:200000. 10 x 18. México, E. M. Moreau y ho., [1893].

1894.

Carta general del Estado de S. Luis Potosí. Levantada por iniciativa de su actual gobernador, Gral. Carlos Diez Gutiérrez, por la Comisión Geográfico-exploradora. México, 1894. Scale, 1:250000, or 4 stat. miles to an inch. 12 sheets.

NOTE.—The scale on which this map is drawn is sufficiently large to admit of a considerable amount of detail being shown. The altitudes are given in meters and all means of communication are laid down. On the different sheets of the map some useful statistical and geographical information is given in tabular form, together with insets showing the political divisions and geographical positions. The hill shading employed is effective, the rivers and streams are printed in blue, and the lettering clear.

Title taken from the Geographical Journal, London, 1896. v. VII, no. 1.

1894.

Ferrocarriles de Hidalgo y del Nordeste; plano general. 1:250000. 1894.

U. S. War Dept. Lib.

1894.

Mexico. 17½ x 23½. [Philadelphia], W. M. Bradley & bro., 1894.

NOTE.—From Bradley's Atlas of the world. p. 73. Philadelphia, 1885.

L. C.

1894.

Karte der Verbreitung der Sprachen in Südost-Mexico und Britisch Honduras um's Jahr 1894. Von Dr. Karl Sapper. Massstab: 1:4000000. 9¾ x 12½.

[In Petermann's Mittheilungen. 1895. 4°. Gotha, J. Perthes, [1895]. v. 41, pl. 12. at end.]

L. C.

1894.

Map of the United States of Mexico. Drawn and compiled from the latest Mexican and United States Government autnorities, and other reliable sources. By Oscar Hindrichs, C. E. Scale, 1:5385600. 16½ x 22½. [In Moore (Henry). Railway guide of the Republic of Mexico. Springfield, O., Huben & More, 1894.]

L. C.

1894.

A general map of the Republic of Mexico, by Brigadier-General Pedro García Conde, engraved from original survey by order of the Mexican government, and colored to show the departments. The capitals of departments, cities, towns, villages, and farms are given; also military centres, anchorages, etc. Four sheets; 50 x 37 inches; 64 miles to an inch (1:055040).

NOTE.—Title from Stanford's Catalogue of maps. London, Oct., 1894.
British Museum catalogue of maps mentions editions of 1845 and 1848 (?) of this map.

1895.

Chávez (E. A.) República Mexicana. Recto: Carta muda de geografía física. Verso: Carta muda de geografía política. Paris, Impr. lithog. Ve. Bouret.

—— Carta general de los Estados Unidos Mexicanos, según los últimos datos, formada bajo la dirección de Ezequiel A. Chávez, para uso de las escuelas primarias de la República. Échelle: $\frac{1}{2}$, 683,44. Cartes muette et avec lettres. Paris, 1895. Imp. Monrocq; lib. Bouret.

Taken from "Bibliotheca Geographica, 1895."

1895.

Map of Mexico. 9 x 10.

[In Campbell (Rean). Campbell's complete guide and descriptive book of Mexico. 12°. Chicago, 1895.]

L. C.

1895–1896.

Carta de comunicaciones de los Estados Unidos Mexicanos. Formada de orden de la Secretaría de Estado y del Despacho de Comunicaciones y Obras Públicas por el Coronel Bodo von Glúmer. Escala: 1:1000000. 1895–1896. 2 sheets, each 51 x 93. Berlin, Grabado é impreso en el Instituto Litográfico, 1895–96.

L. C.

1896.

Carta de la República Mexicana, á la 100000ª. Secretaría de Estado y del Despacho de Fomento. Comisión geográfica de Guerra y Fomento bajo la dirección del ing. A. Díaz. Dib. y escrit.: J. López. Constr. y config.: Ing. R. Sandoval. Iª edición, 1888.—Publicada en 1896. Iª serie. Hoja-19-1 (Y). 16$\frac{3}{4}$ x 22.

L. C.

1896.

The valley of Mexico. To illustrate the paper by O. H. Howarth. 1:15000000, or 1 inch–8 miles. 8$\frac{1}{2}$ x 7$\frac{3}{4}$.

[In Royal Geographical Society. Journal, 1896. 8°. London, 1896. v. 8, p. 200.]

L. C.

1897.

Carta de la República Mexicana, á la 100000ª. Secretaría de Estado y del Despacho de Fomento. Comisión geográfica de Guerra y Fomento bajo la dirección del ing. A. Diaz. Constr. y dib.: E. Estrada. Config.: C. Rivera. Escrib.: J. Samaniego. Bajo la inspecc. del Ing. C. T. Alvarez. Iª edición, 1893.—Publicada en 1897. Iª serie. Hoja-51-(L). 16$\frac{3}{4}$ x 22.

L. C.

1897.

Geologische Karte von den Vereinigten Staaten und Mexiko. Massstab: 1:20000000. 8$\frac{1}{2}$ x 10$\frac{1}{2}$.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. 1897. v. 17, bet. pp. 230–231.]

L. C.

1897.

Mexiko. Massstab: 1:12000000. 8½ x 10½.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. Leipzig und Wien, Bibliographisches Institut, 1897. v. 12, bet. pp. 234-235.]

L. C.

1897.

Mexiko. Massstab: 1:12000000. 8½ x 11.

[In Brockhaus' Konversations-Lexikon. 14te Aufl. 8°. Leipzig, F. A. Brockhaus, 1895. v. 11, bet. pp. 840-841.]

L. C.

1897.

Mexique. Échelle du 10,000,000e. Gravé et imp. par Erhard fres., 1897. 10 x 14.

[In Grande (La) Encyclopédie. 8°. Paris, H. Lamirault & cie., [1885-96]. v. 23, bet. pp. 864-865.]

L. C.

1897.

A section of north Mexico showing the journeys of J. Gurdon L. Stephenson, F. R. G. S., and A. Krauss, F. R. G. S., 1897. Scale, 1:1250000 or 1 inch—19.7 miles. 27 x 14.

[In Royal Geographical Society. Journal, 1898. 8°. London, 1898. v. 11, p. 464.]

L. C.

1897.

The Century Atlas. Mexico. 10½ x 15. New York, The Century co., 1897.

L. C.

1897.

The Century Atlas. Mexico, central portion. 10½ x 15. New York, The Century co., 1897.

L. C.

1897.

Vereinigte Staaten und Mexiko. Massstab: 1:20000000. 8½ x 10½.

[In Meyers Konversations-Lexikon. 5te Aufl. 8°. Leipzig und Wien, Bibliographisches Institut, 1897. v. 17, bet. pp. 224-225.]

L. C.

1898.

Mexico. Scale statute miles, 69.16—1 degree. Kilometres, 111.307—1 degree. 19 x 26. Chicago, Rand, McNally & co., 1898.

NOTE.—From Rand, McNally & company's Indexed Atlas of the World. Inset: "Map of the valley of Mexico on enlarged scale."

L. C.

1898.

Rand, McNally & co.'s indexed State and railroad map of Mexico, showing the railroads, islands, lakes, mountains, rivers, States, towns and villages. 61 pp. 1 fold. map. 18°. Chicago and New York, Rand, McNally & co., [1898].

1900.

Mexico. From official Mexican and other sources. Scale, 50 miles to the inch. Size 39 x 28½. Prepared by the Bureau of the American Republics. Washington, 1900.

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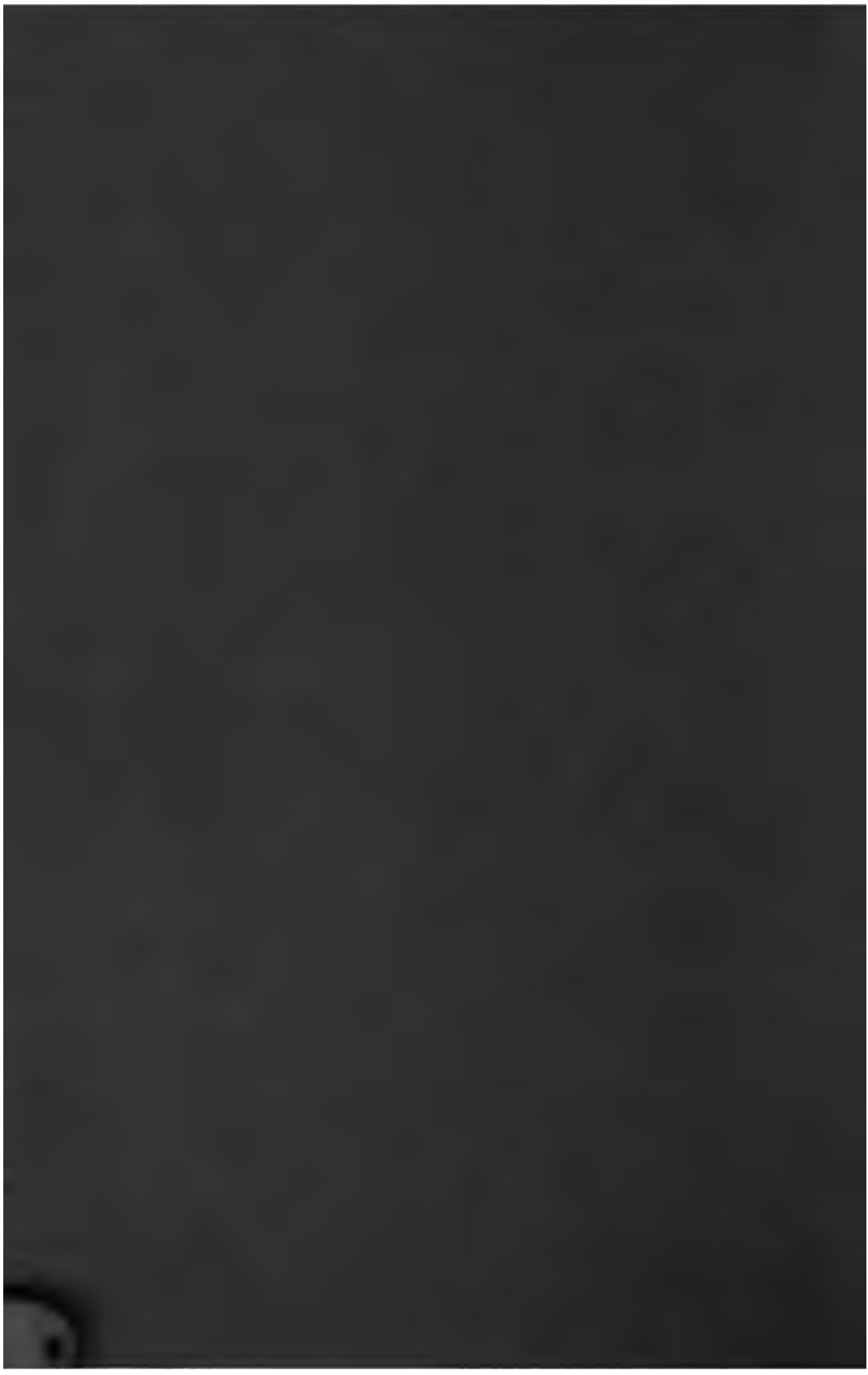

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